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THE

ENTOMOLOGIST'S MONTHLY MAGAZINE:

CONDUCTED BY

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SECOND SERIES—VOL. II.

[VOL. XXVII.]

> "An inner impulse rent the veil
> Of his old husk: from head to tail
> Came out clear plates of sapphire mail.
> He dried his wings; like gauze they grew;
> Through crofts and pastures wet with dew,
> A living flash of light he flew."—*Tennyson.*

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THE
ENTOMOLOGIST'S
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SECOND SERIES—VOL. II.

[VOLUME XXVII.]

EDITORIAL.

Mr. G. C. Champion, F.Z.S., who has been a contributor to this Magazine almost from its commencement, has joined the staff, and will give his assistance in his own special Order, and generally.

ON CERTAIN BRITISH SPECIES OF *CONCHYLIS*.

BY THE RIGHT HON. LORD WALSINGHAM, M.A., F.R.S., &c.

Conchylis affinitana, Dgl.

Cochylis affinitana, Dgl., Zool., iv, 1269-70, 1268, fig. 7. (1846).
n. syn. = *Cochylis cancellana*, Z., Is., 1847, 739-40.

In 1884, Mr. W. H. B. Fletcher was good enough to send me some stems of *Statice limonium* from the Isle of Wight, from which I bred a nice series of *Goniodoma limoniella*, Stn. From among these stems appeared a single specimen of *Conchylis affinitana*, Dgl. I have carefully compared this bred specimen with the type of *Conchylis cancellana*, Z., and they are obviously the same species.

My acquaintance with this insect has lately been renewed by breeding it from larvæ found in the dead stems of *Aster tripolium* in a salt marsh near Cannes, last April. They entirely agree with English examples, and as one *Bucculatrix maritima* also appeared from among the stems of *Statice* sent by Mr. Fletcher, there is no doubt that *Aster tripolium* occurred where he found them. The larva of *cancellana* has not been recorded under this name, nor, indeed, has the perfect insect been recognised, so far as I am aware, since Zeller took it in Sicily, in 1844.

Hartmann (Mitth. München. Ent. Ver., 1879, 178) quotes Wocke, to the effect that the larva of *affinitana*, Dgl., feeds in the stems of *Aster tripolium*; and McLachlan (Ent. Ann., 1869, 89) mentions that he had received specimens from Heinemann bred from the flowers of the same plant. Sicilian collectors should now have no difficulty in re-discovering the species in the locality originally indicated by Zeller.

The name *affinitana*, Dgl., takes precedence, as dating from the year previous to the publication of Zeller's description, thus no alteration is needed in our British lists.

CONCHYLIS HEYDENIANA, H.-S., and IMPLICITANA, Wk.

McLachlan, following Wocke, who corrected Herrich-Schäffer in a letter published by that author (Schm. Eur., vi, 157–8), pointed out (Ent. Ann., 1869, 90), that the description of *Heydeniana*, H.-S., differs from his figure (pl. lii, 369), to which it was intended to apply, and rightly concludes that two separate species are indicated. I have in the Zeller collection specimens labelled, "*heydeniana* (? H.-S., fig. 369), Hm. 83," in Zeller's writing, showing that he also had a doubt whether the figure applied to this species.

McLachlan (Ent. Ann., 1869, 90) refers to letters from Heinemann, giving *Gnaphalium* and *Pyrethrum inodorum* as the food-plants of *Heydeniana*, but Heinemann himself [Schm. Deutsch., i (1), 83 (1863)], in referring to this species, mentions only the flowers of *Anthemis cotula*, from which one may infer that he was doubtful as to the identity of the species feeding on allied plants. This may, perhaps, account for his suggestion, "? = *subroseana*, Wilk."

Wocke only knew *implicitana*, Z. (MS.), from South European specimens, and he described this in his letter to Herrich-Schäffer, the publication of which has caused this species to be wrongly designated as "*implicitana*, H.-S.," whereas it should be *implicitana*, Wk. Writing obviously after the publication of Herrich-Schäffer's fourth volume, in 1849, he was under the impression that no specimens of this species existed, except in his own collection; but I find a specimen in the Zeller collection, received from Mann, in that year, and this is probably the South European species referred to by Wocke, although no locality is mentioned on the label. The specimen is not in good condition, but the central fascia appears to be narrower and more evenly distributed towards the costa, thus agreeing with Wocke's description. From this single specimen it would be rash to pronouce it distinct from *Heydeniana* ; but a specimen taken at Cannes, last April, agrees so closely with Herrich-Schäffer's fig. 369 (plate lii), as to leave little doubt that this is the species figured, and it is obviously distinct from *Heydeniana*; the figure was probably taken from a specimen referred to in the description as collected by Salviano in Italy. Dr. Wocke wrote the part of Staudinger's Catalogue dealing with the *Tortricidæ*, and he gives *Heydeniana* and *implicitana* as distinct species. The type of *implicitana* was, of course, well known to Wocke, as it was described by him in the letter referred to above. Staudinger acquired Herrich-Schäffer's collection ; so it is presumable that Wocke was acquainted with the type of *Heydeniana*. Since Wocke had such facilities for comparing these two species, it would be rash, without an independent comparison of the types, to say that he was mistaken in regarding them as distinct.

The species occurring in this country on *Anthemis* seems to be undoubtedly *Heydeniana*, H.-S. Without professing to give its full synonymy, I may mention that von Heinemann is right in identifying it with *anthemidana* (Curt.), Wilk. The species which stands under this name in British collections is well known to all Norfolk collectors as feeding in the flowers of *Erigeron acre*, a plant which, in common with *Erigeron canadense*, is widely distributed over the light soils in the neighbourhood of the breck sands of the Brandon district. There is no suspicion that this species ever feeds on *Anthemis* ; I have taken it in Kent, where *Erigeron* was abundant, and have received it from Mr. Farn from Sussex, but it is quite distinct from the species feeding on *Anthemis*, and has not yet received a specific name. Having been, I think, the first to observe it some 25 years ago, I may, perhaps, be permitted to supply the omission.

CONCHYLIS (EUPŒCILIA) ERIGERANA, *sp. n.*

Antennæ greyish. *Palpi* whitish, tinged externally with brown. *Head* whitish. *Thorax* whitish, with a slight ochreous tinge. *Fore-wings* whitish, slightly tinged with ochreous, the costal margin shaded at the base and middle with greyish-fuscous ; a rather broad oblique fascia, reaching from before the middle of the dorsal margin to within one-third of the costa, is of an umber-brown, with an admixture of some fuscous scales ; a greyish-fuscous cloud partly connecting it at an angle with the costal margin ; this fascia is slightly extended outwards on the fold, and is usually less deeply coloured above and below it ; on the apical third of the wing are a few umber-brown mottlings, intermixed with greyish-fuscous reticulations, which form a costal spot before the apex; on the dorsal margin below the anal angle is a small, rather triangular, fuscous spot; the apical margin of the wing is more or less tinged with greyish in fresh specimens; cilia the same as the ground-colour of the wing, with a distinct greyish-fuscous line running along their base, some greyish spots are visible along their outer half, but these are distinctly separated from the grey basal line. *Hind-wings* greyish, with slightly paler cilia, in which a faint median shade is visible. *Abdomen* grey, anal tuft inclining to ochreous. *Legs* pale greyish.

Exp. al., 10—12 mm.

Type, ♂ ♀. Mus. Wlsm.

The small ivory-white larva with a brownish head feeds in the flowers of *Erigeron acre*; its presence is easily detected when the seeds are ripe by the gathering together of the central florets, the outer seeds subsequently falling off leave only the small tuft which contains the pupa. I have not yet found it in the smaller florets of *Erigeron canadense*, which occurs in the same localities in Norfolk. The imago appears in the beginning of June, the end of July, and the beginning of August. This species is not known to occur on the continent. In England, it is found at Shoreham (Kent); near London; on the borders of Norfolk and Suffolk; and near Norwich.

It differs from *Heydeniana*, H.-S. (= *anthemidana*, Wilk.), in its smaller size, in the absence of any true rosy tint on the head and wings, in the decided angle formed by the fuscous cloud which connects the oblique fascia with the costa, and in the row of three or four greyish spots on the outer half of the cilia of the fore-wings, the lower one of which, at the anal angle, is the only one usually to be detected in that closely allied species.

Mr. Meyrick was good enough to take some specimens of *Conchylis anthemidana*, Wilk., and *erigerana*, Wlsm., for me to Australia a few years ago, in the hope of being able to compare them with Curtis' type, which was supposed to have been taken to Melbourne with his collection. I quote the following from a letter received from him, dated September, 1886:—

"On my way through Melbourne last week, I was at last enabled to examine Curtis' collection for the type of *Eupœcilia anthemidana*, for comparison with which you entrusted me with specimens. The result was nothing, as there were no specimens in the collection under that name, nor any agreeing with those sent. Either the type of *E. anthemidana* was never in the collection, or it was removed before the collection left England. I made a general inspection of the collection, which is clean, and in very good condition. The point in question must, therefore, remain unsolved; and I will return your specimens on reaching England."

The synonymy of this species is as follows:—

CONCHYLIS ERIGERANA, *sp. n.*

= *Eupœcilia anthemidana*, McL., Ent. Ann., 1869, 92, 3 (*ex parte*); Barrett, Ent. Mo. Mag., xi, 194, 5 (1875) (*ex parte*).

London: *November* 17*th*, 1890.

CAN *DEILEPHILA GALII* BE FOUND IN THE LARVAL STATE EVERY YEAR IN ENGLAND?

BY W. H. TUGWELL.

Mr. C. G. Barrett, in Ent. Mo. Mag., 1890, p. 300, says, "that he is assured that *galii* larvæ are to be found every year in the sweeps of sandy coast from Llandudno, North Wales, to Grange, in the north of Lancashire."

I assume that by Mr. Barrett's particularly mentioning the names of Messrs. Capper, Gregson, Pierce, and Harker, that his information is to be taken as coming from them; if this is the case, I am in the position to prove that that idea is certainly not held by nearly all these gentlemen, as they know well, what I shall later on prove by facts, that there is no evidence that *galii* has been taken or seen on the Wallasey sand-hills since 1870 until 1888, a period of 18 years.

Lancashire and Cheshire have long been noted as the home of some of our best, keenest, and hardworking entomologists. Such men as the late Mr. Nicholas Cooke, Mr. N. Greening, Mr. Joseph Sidebotham, with Messrs. Gregson, Capper, J. B. Hodgkinson, and a small army of minor workers; most, if not all, of these gentlemen have been in the habit of freely recording the results of their labours in the entomological serials, such as the "Entomologist's Weekly Intelligencer," the "Entomologist's Monthly Magazine," and the "Entomologist." Through the pages of these journals I have made a most careful search for any record on the capture of *galii*, and with the following pretty conclusive results:—

In the "Entomologist's Weekly Intelligencer" for 1856, we read that a single larva was taken at Brighton, as it stands as having been bred in 1857; and there are five more reported as captured imagines, one each at Brighton, Rugely, and Lewisham, and two at Stowmarket. In 1858, three are chronicled, one each at Brighton, Worthing, and Southport. In 1859, there are twelve reported captures of imagines, spread over a considerable area, viz., Gainsborough, Darlington, Hackney, Suffolk, Cambridge, Oundle, Somerset, Kent, Beccles, and Macclesfield; and larva of *galii* were found at Hackney, Dover, and Wallasey.

In the pages of the "Entomologist's Monthly Magazine," from 1864 until 1870, there is no record of *D. galii* being found at all, but in 1870 they occurred in some numbers all over England, extending to Perthshire. In 1871, eighteen larvæ are reported from Brighton; but from 1871 until 1888, a period of 17 years, not a single capture of *galii* is on record, either as imagines or larvæ.

In vol. xxiii of Ent. Mo. Mag., 1886–7, there is a most important item bearing on this very question: Dr. J. W. Ellis, in an article or paper on "Entomological localities near Liverpool," writing of Wallasey sand-hills, page 60, says, "by examining the tufts of yellow *Galium* (*Galium verum*), the larvæ of *Deilephila galii may be looked for*; it once occurred in abundance here (in 1870), *but it has not been met with since.*" Now, few people knew this locality perhaps better than did Dr. Ellis; he had, in company with many other entomological friends, closely worked this spot, yet he says most distinctly, *that galii had not been found at Wallasey since* 1870. Writing this in 1887, this gives a period of 17 years in which there is absolutely no record of *galii* having been seen. How does the assured occurrence of it every year agree with this statement? Who has found it every year?

A strict search through the whole series of the pages of the "Entomologist" gives the same results. Vols. ii, iii, and iv, *galii* is a blank, but in vol. v, 1870, both imagines and larvæ are reported over the greater part of England, and even in Perthshire; they were found at Leominster, Gloucestershire, Chepstow, Edgbaston, Derby, Herefordshire, Notts, Durham, Staleybridge, Middlesex, Plymouth, Witham, Bolton, Weston-super-mare, Ipswich, Perthshire, Newcastle, Tooting, Durdham Downs, Kent, and Wallasey. Now, although the larvæ were common in September in many of the above places during 1871–2–3, not a single capture was made of imagines; in 1875, *two imagines* were noted in Norwich only; from 1875 to 1888, thirteen years, not a single record is to be found; and but for the two imagines at Norwich, seventeen years had passed, and no capture of larvæ had been certified, either from Deal or Wallasey!

It is worth noting that out of the eight reported captures of *imagines* in 1857–8, four of them were captured in *September*; but we have not a single record of larvæ of *galii* being found in England that could have produced these September moths. On the continent, where they get more sun and warmer autumn, yes, *always* two broods; but in England, *never*. *When we do get larvæ in this country; it has always been, end of August to mid September!*

Thus, according to record, we have (in modern times) had three *galii* years, viz., 1859, 1870, and 1888, and this is all that can be shown; and it must rest on those who make the statement, that "*galii* is to be found in England every year," to prove their case by facts; a mere assurance that they are to be so found is not at all satisfactory.

The size, too, of all the caught examples of *D. galii*, when compared with English bred and fed examples, points conclusively to their probable origin as being South European, they are much larger than those from our English-fed larvæ. Who ever saw a bred English male 3½ inches expanse, or a female of same origin measuring 3⅝ inches full? Any of *our* largest *galii* look quite small beside them; it is striking when seen together.

A great point is always made by those who hold to the "native" theory, of the improbability of the parent moths reaching so far as Wallasey, and crossing England and the channel to do so; but, truly, is that an insuperable flight for such insects as *galii* or *C. nerii?* There is not a shadow of doubt but that the latter insect does immigrate here from time to time, and so, doubtless, does *galii*. Does any one believe that in Ireland and Scotland *galii* exists every year in the larva state? I much doubt if any one holds to this; then must they not immigrate to reach those points? and if a few do this, as is proved, what is there to make it a matter of surprise if, at fairly long intervals, part of a migratory flight crosses England in any direction; doubtless, a flight of insects would be controlled by direction of the wind, hence it is called the "blown over" theory. We all know that, however strong the flight of a Lepidopterous insect may be, if started up in a strong wind gust, it is carried away by its force, and that would necessarily give a bias as to the direction of migration. It is, doubtless, a different force to that of seasonal migration of birds, but migration of insects is much too well authenticated for any one to doubt its existence. Hawk-moths have been captured 800 miles from land, why then doubt the passing of our "silver streak?"

Of the great number of *galii* that occurred all over, or, at least, a considerable area, of England in 1888, it is, perhaps, of little moment as to whether they were more numerous at Wallasey than at Deal or elsewhere; but, from the best information possible to get, I am informed that from the Wallasey hills possibly not 112 were bred, and 150 would be the outside number. We are told that one party got a cigar-boxful; I can only say that at Deal one morning, I, my wife, and Mr. Lachlan Gibb collected forty-five larvæ, but as each larva was in a *separate* box, I cannot say if they would fill a cigar-box, but, at any rate, it required five large hat-boxes to feed them up in. It is on record that Mr. Meek found fifty larvæ one morning at Kingsdown, Kent, so that possibly there was very little to choose between as to numbers; suffice it to say, that I believe I stand as a "record" for breeding the greatest number of *galii* for 1888-9, viz., 112 imagines.

That Mr. Gregson may have taken a few larvæ at Wallasey in 1889 is quite possible, but it is beyond dispute that in doing so he stands alone; every one else failed, not only at Wallasey, but at Deal; I spent a month there in 1889, and could not find one. That is, perhaps, strange, but true; numbers of larvæ must have pupated in 1888, but what became of the moths, or their progeny, if any resulted from them, is a difficult problem to solve. My opinion is, that our climate is too cold to produce *galii* sufficiently robust to prove capable of bearing fertile ova, so that they exist one season only, and die out.

Greenwich: *November*, 1890.

[I am not disposed to argue the point—indeed, the point is not *mine*. I thought the facts and the opinions gathered up in Lancashire worthy of record and of consideration, but I do not feel bound to champion them, as they do not arise from my own observations. One point must be conceded: if I in any way suggested that all the Liverpool entomologists named hold precisely the same views, I beg to withdraw the suggestion, it should not have been made; indeed, no one could expect such identity of opinion.—C. G. B.]

GELECHIA (*ANACAMPSIS*) *SPARSICILIELLA*, *n. sp.*

BY C. G. BARRETT, F.E.S.

Expanse, 5 lines. Head dark grey, antennæ blackish above, paler beneath, thorax blackish, abdomen slightly paler. Fore-wings, narrow, with acute apex, brown-black, the usual three spots black, but hardly visible in the ground colour, fascia indicated by two nearly opposite faintly ochreous blotches, that on the dorsal margin being slightly posterior; beyond these the costal and dorsal margins at the base of the cilia are indented with smaller faint ochreous blotches, two or three on each margin, cilia of mixed dark grey and ochreous, abundantly dusted with black dots. Hind-wings brownish-grey, rather paler at the base, cilia pale grey.

Differs from all other described species, as far as I can ascertain, by the pale blotches at the base of the costal and dorsal cilia, which give that portion of the wing an indented appearance. From the closely allied *coronillella* and *anthyllidella* it may also readily be distinguished by its narrower fore-wings and their more acute apices.

This species has been in my collection for some years. I took about a dozen by sweeping mixed herbage in a quary near Pembroke, and then noticed its distinction from *anthyllidella*, but have waited until it could be satisfactorily ascertained that it is hitherto undescribed. By Lord Walsingham's kindness I have had an opportunity of comparing it with the species in the collection of the late Professor Zeller, and now think that I am tolerably safe in introducing it as a novelty. A single specimen is in the collection of my friend, Mr. Capper, of Huyton Park, Liverpool, but unfortunately without locality.

39, Linden Grove, S.E.:
December, 1890.

SYMMOCA SIGNATELLA, H.-S., A RECENT ADDITION TO THE BRITISH FAUNA (*LEPIDOPTERA*).

BY A. F. GRIFFITH, M.A.

S. SIGNATELLA.

Exp. 5‴—7‴. Fore-wing pale grey, with dark grey markings, viz., an oblique dot on the costa near the base, an angulated and interrupted transverse line before the middle, a V-shaped mark on the inner margin beyond the middle the apex of which approaches the anal angle, and a spot on the costa nearly opposite, a row of dots at the base of the fringes, and a darkish cloud near the middle of the hind margin; hind-wing darkish grey, not emarginate. VIII, IX.

Larva said to feed on lichens on trees.

I took six specimens of this very distinct insect in the neighbourhood of the London Docks on August 7th, 1889, and another single specimen on September 17th, 1890. They had no doubt been introduced with some cargo, possibly Spanish cork. Mr. Stainton (who kindly identified them for me) states that the species has been gradually extending its range from the Mediterranean regions, and has somewhat lately become domiciled near Paris. My specimens appear to run somewhat smaller and (especially in the hind-wing) darker than those in his collection, which he received from M. Ragonot and from M. Millière.

The genus *Symmoca* of Hübner has been placed among the *Gelechidæ*, between *Sophronia* and *Pleurota*. But Mr. Stainton points out that though Frey, in 1856, placed it between *Psecadia* and *Prays*, in his later work (1880) he places it between *Depressaria* and *Gelechia*; and this last situation Mr. Stainton considers to be the most appropriate. I have also to thank him for the following note of the characters of the genus:—

Palpi slightly recurved, the middle joint thickened with appressed scales, terminal joint equally long, aciculate. Anterior wings elongate, with obliquely curved hind margin, and the apex almost rounded; the posterior wings not indented below the apex.

Brighton: *December*, 1890.

A FORTNIGHT IN ALGERIA, WITH DESCRIPTIONS OF NEW *LEPIDOPTERA.*

BY E. MEYRICK, B.A., F.Z.S.

In April, 1890, having a limited period of three weeks at my disposal, I determined to make an entomological trip to Algeria. One week was consumed in the double journey ; in the remaining fortnight I traversed a good deal of ground, and although little favoured by weather and considerably incommoded by ill-health, I acquired a certain amount of material, which has proved to be of some interest. The winter in Algeria had been, as I was told, unusually cold and wet, and rain fell frequently during my stay ; even in the Sahara we had a heavy fall, probably quite an inch, one night Hence insects were presumably backward ; and on the high plateaux, above 4000 feet, there was a good deal of fresh snow, and it was still too early even to attempt collecting there.

I landed at Philippeville, and spent three days there ; the high surrounding hills, covered with a dense growth of *Cistus*, *Erica*, and a great variety of other shrubs and flowering plants (but few trees), seemed an ideal collecting ground, but insects were very scarce ; I believe that a month later better results would be obtained. Thence I proceeded to Constantine, about 60 miles inland, the ancient Numidian capital ; perched on a table of rock at an elevation of some 2000 feet, enclosed by an immense ravine, and surrounded by rocky hills with but little vegetation, it could at no time be very prolific. I made no attempt under the circumstances to visit the cedar forests, which lie at high levels, but went on to Biskra, which was the chief goal of my journey. It is an oasis of 100,000 date palms, situated within the verge of the plain of the Sahara, nearly 200 miles from the coast, and about 350 feet above sea level. For some 60 miles before reaching it the country is desert, but consists of high limestone ranges, which terminate abruptly in the great sand plain. Vegetation at Biskra, except in the irrigated gardens of the oasis, seems at first sight to be entirely absent ; but in fact there is almost everywhere a scanty sprinkling of little shrubby plants of quite a number of species, peculiar to the desert. These are, however, so efficiently browsed by the numerous goats and camels of the Arabs, that many insects must be unable to exist there on that account alone. Moreover, the neighbourhood of the intensely heated plain on one side, and the high snow-topped ranges on the other, cause Biskra to be a very windy place ; in point of fact, except on the first evening, it blew more or less of a gale during all the six days that I stayed. There is practically no shelter for insects except at the roots of plants, and as these are nearly all thorny, the difficulties of collecting are not slight. Hence I did not get much; I searched during the whole of one day with the result of one specimen only, but what I did get was good. Returning from Biskra, I tried the picturesque gorge of Elkantara, where I ascended the limestone mountains to about 2000 feet, but obtained almost nothing. Travelling by way of Setif, I visited Kharata, lying at the head of the magnificent defile of the Chabet-el-Akhira, enclosed by forest-clad precipices, 3000 to 5000 feet high, which ought to have abounded in insects, but were apparently almost destitute of them; and so finally reached the sea again at Bougie.

In determining my captures, I found with surprise that very little has yet been done towards working out the Algerian *Micro-Lepidoptera*, hence the proportion of novelties is not inconsiderable. I am indebted to the kindness of Mr. Stainton for assisting me to compare the new *Tineina* and doubtful species with his continental collection, and for his opinion on some geographical forms.

The following is a complete list of *Lepidoptera* captured; but it should be remembered that in the *Rhopalocera* and *Noctuæ* I made no special search, but simply took what lay in my way.

Pyrameis cardui, L.—common at Biskra, and flying freely in spite of the wind; I also took a larva there, and bred the imago.

Pararge Ægeria, L.—Philippeville and Bougie, common; the southern fulvous form only; the difference from the pale English form is very striking.

Polyommatus Phlæas, L.—Constantine and Biskra; several specimens.

Thestor Ballus, F.—Bougie; two specimens.

Lycæna melanops, B.—Philippeville; common on a waste hill above the town.

Pieris brassicæ, L.—Philippeville; common.

Anthocharis Belemia, Esp.—Biskra and Bougie, common; specimens from the latter locality more strongly marked. *A. Eupheno*, L.—common at Philippeville.

Thaïs rumina, L.—Bougie, occasional.

Psyche sp.—I bred a species of this genus from Constantine, but have not succeeded in determining it satisfactorily at present.

Fumea intermediella, Brd.—several specimens of what appears to be this species bred from Philippeville.

Procris sp.—a single specimen of a small species taken at Philippeville; it is not in good condition.

Spilosoma (?) *sp.*—larvæ of a species of this group were abundant at Constantine, feeding gregariously on lilies, *Umbelliferæ*, &c.; I brought away some, but failed to rear them, as they succumbed to the hardships of travel.

Metopoceras khalildja, Oberth.—Constantine; one specimen at light.

Plusia gamma, L.—common in some parts of the desert at Biskra, and I also saw the larvæ on the flowers of one of the *Compositæ*.

Cucullia umbratica, L.—one on a gas lamp at Constantine.

Eupithecia tamarisciata, Frr.—Constantine and Philippeville, rather common on lamps.

Cidaria decolorata, Hb.—Philippeville; one worn specimen.

Larentia fluctuata, L.—common at Constantine on gas lamps; the specimens vary, but are mostly larger than English, and at first sight very different looking, the ground-colour being greyer and the markings little darker than the ground.

Anthometra megearia, Oberth.—two specimens at Biskra.

Acidalia virgularia, Hb.—Philippeville, Constantine, Bougie; generally common. All the specimens are of the white southern variety, and I quite failed to recognise their identity until I got home. *A. emutaria*, Hb.—one specimen near the gorge at Kharata.

Metrocampa honoraria, Schiff.—Bougie; one specimen.

Cornifrons ulceratalis, Ld.—Biskra; one specimen at light.

TITANIO ZACHLORA, *n. sp.*

♂. 17 mm. Head and thorax black, strewn with whitish-ochreous scales and hairs; frontal prominence moderate, without accessory spines. Palpi mixed with blackish and whitish; maxillary moderate, dilated with loose hairs; labial clothed with very long rough projecting hairs beneath. Antennæ whitish-ochreous, marked with black, ciliations long (3), fasciculated. Abdomen black, densely strewn with whitish-ochreous scales. Legs whitish-ochreous, anterior and middle pairs partially suffused with grey, femora densely hairy beneath. Fore-wings elongate-triangular, costa almost straight, hind-margin somewhat obliquely rounded; pale brownish-ochreous, mixed with whitish-ochreous and irrorated with black; costal half suffused with whitish-ochreous from base to middle; lines blackish, ill-defined, first from one-fourth of costa to two-fifths of inner margin, somewhat bent below middle, second from four-fifths of costa to three-fourths of inner margin, slightly indented beneath costa, thence to below middle gently curved outwards, anteriorly strongly margined with whitish-ochreous; a small transverse discal spot beyond middle indistinctly formed by black irroration; a whitish-ochreous streak along hind-margin; a fine blackish hind-marginal line; cilia whitish, with a grey median line becoming black at apex, basal half finely barred with black, with a blackish spot at anal angle. Hind-wings clear pale whitish-ochreous; a dark grey discal dot at one-third; a curved, well-defined, strong blackish line at three-fourths, parallel to hind-margin, obsolete on costa; a few scattered black scales between this and hind-margin; a narrow black streak along hind-margin throughout; cilia whitish, basal fourth whitish-ochreous, mixed and obscurely barred with black.

Biskra; one specimen, in perfect condition. The species is probably nearest to *T. floralis*, but very distinct from it structurally by the very long hairs of palpi, and hairy femora, as well as in colour and marking. The genus *Titanio* is to be understood as defined in my paper on the European *Pyralidina* in the current issue of the Transactions of the Entomological Society of London; and the same caution applies to the other genera of *Pyrales* (including *Pterophoridæ*) here quoted.

Scoparia angustea, Stph.—common on tree trunks at Philippeville. This is a characteristically southern species, which is probably enabled to live in England only by the comparative mildness of our insular climate in winter.

Duponchelia fovealis, Z.—Biskra; several specimens.

Synaphe armenialis, Ld. (?)—I took at Biskra a worn ♀ specimen which agrees well enough with this species, but it is not sufficiently good to identify certainly.

Mnesixena leonalis, Oberth.—Biskra; two specimens. I had not previously seen this insect, and can now affirm that it is a true *Mnesixena*, and not a *Pyralis* (*Stemmatophora*), as referred by Oberthür.

Euzophera sp. (?)—a single specimen taken at Biskra, very closely resembling *E. pinguis*, but it can hardly be that species. *E. oblitella*, Z. (?)—one specimen at light, Biskra, which is apparently truly referable to this species, but it differs somewhat from my French specimens.

Euchromius superbellus, Z.—Biskra; one specimen.

Trichoptilus siceliota, Z.—one specimen at Philippeville.

PTEROPHORUS PROBOLIAS, *n. sp.*

♀. 22 mm. Head, palpi, and thorax whitish-ochreous, yellowish-tinged; entire face projecting to form a strong rounded prominence, equalling two-thirds of eye. Antennæ whitish. Abdomen yellowish-whitish above, more yellowish beneath. Legs white, anterior and middle pairs longitudinally striated with black, less distinctly on tarsi. Fore-wings cleft to middle, segments linear; veins 2 and 11 present; whitish-ochreous; costal edge white towards base; a very fine dark fuscous costal streak from about one-third to three-fourths, anteriorly mixed with white scales, posteriorly becoming somewhat broader but less defined; cilia whitish-ochreous, with terminal half dark fuscous on posterior half of lower margin of first segment, and of both margins of second segment. Hind-wings cleft firstly to before two-thirds, secondly to five-sixths, segments linear; pale grey; cilia grey-whitish, faintly ochreous-tinged.

Elkantara; one specimen. Allied to *P. xanthodactylus*, with which it agrees in neuration, but differing in marking, and specially characterized by the peculiar strong projection of the face. *Pterophorus*, as defined in my paper quoted above, is the genus hitherto usually called *Aciptilia*.

Penthina oblongana, Hw.--Philippeville; one large specimen.

Eudemis botrana, Schiff.—Philippeville; one specimen.

EUDEMIS ISOCHROA, *n. sp.*

♂. 12 mm. Head white, sides of crown slightly ferruginous-tinged. Palpi pale ferruginous sprinkled with black, internally and on apex of second joint white. Antennæ blackish, ciliations 1. Thorax yellow-ochreous, on back mixed with whitish, shoulders ferruginous. Abdomen dark grey. Legs blackish, posterior pair and apex of joints whitish. Fore-wings elongate, posteriorly dilated, costa gently arched, apex obtuse, hind-margin slightly rounded, rather oblique; vein 7 to costa; yellowish-ferruginous; costa narrowly suffused with deep ferruginous, mixed with dark grey; a pale yellow suffusion occupying basal two-fifths except towards margin; a large, deep, ferruginous patch, sprinkled with dark grey, towards anal angle, extended upwards as a suffused band along hind-margin; cilia whitish, with a dark grey line, at anal angle ferruginous-tinged. Hind-wings grey, near base thinly scaled, apex and hind-margin dark grey; cilia grey-whitish, with a dark grey line.

Philippeville; one specimen. This peculiar species cannot be compared with any other known to me, and is structurally peculiar in the costal termination of vein 7 of the fore-wings, but is otherwise a true *Eudemis*.

Bactra lanceolana, Hb.—one specimen, taken at Biskra.

Grapholitha minutana, Hb.—Philippeville; several specimens beaten from poplar. These form a variable and very curious series; they are smaller than English specimens, some being much smaller, and the ferruginous suffusion tends to disappear, so that they are mostly much whiter, and one is as white as *G. neglectana*.

Stigmonota Leplastriana, Curt.—Bougie; two specimens.

Dichrorampha sp.—a worn and unidentifiable specimen of the *plumbagana* group, taken at Philippeville.

Batodes angustiorana, Hw.—Philippeville; one specimen.

TORTRIX XYLOTOMA, *n. sp.*

♂. 16 mm. Head and thorax rather light ochreous, face and palpi dark fuscous. Antennæ pale ochreous spotted with fuscous, ciliations 1. Abdomen grey, anal tuft whitish-ochreous. Legs dark grey, posterior tibiæ and apex of joints ochreous-whitish. Fore-wings elongate, moderate, suboblong, costa moderately strongly arched on anterior half, straight posteriorly, apex obtuse, hind-margin straight, somewhat oblique, rounded beneath; light brownish-ochreous, towards hind-margin with some small, very obscure grey spots; costa narrowly and obscurely ferruginous; basal patch obsolete; central fascia starting from before middle of costa, on costal third rather narrow, dark fuscous edged with ferruginous, then becoming suffused with ferruginous, and obsolete on lower half, except a small dark fuscous spot on inner margin before anal angle; a flattened triangular dark fuscous spot extending on costa from two-thirds to apex, edged with ferruginous; cilia pale ochreous, above apex dark fuscous. Hind-wings grey, darker towards apex; cilia grey-whitish, with a grey line.

Bougie; two specimens. I use the term *Tortrix* in the proper and limited sense, to signify the group of which *viridana* is the type, called *Heterognomon*, Ld., in Staudinger's Catalogue. The markings of this species are quite as in *Cacœcia costana*, but it is a browner and less broad-winged insect, and of course differs structurally by the absence of the costal fold.

(*To be continued.*)

OCCURRENCE AT PORTLAND OF *TINEA SUBTILELLA*, FUCHS, A SPECIES NEW TO THE BRITISH FAUNA.

BY N. M. RICHARDSON, B.A.

I have the pleasure of recording the capture of a small moth new to Britain, *Tinea subtilella*, Fuchs. One afternoon early in August Mrs. Richardson and I were collecting at Portland, and I had left her for a short time to go after one or two species which occur on some steep slopes, when she caught a very small moth and boxed it with some difficulty, and soon afterwards took a second, having been much struck with the very hairy head of the first one, which she did not recognise as having seen before. She did not rejoin me until it was beginning to grow dusk, too dark to see what the little moth was.

Next day we examined it carefully, and came to the conclusion that it must be a *Tinea*, though it evidently did not belong to any of our British species, being much too small in the first place, though this, in one of this genus is not conclusive evidence, and unlike in other respects to those most nearly allied to it.

Mr. Stainton has, with his usual kindness, named the species for me, and also gave me some interesting particulars about it, which he has kindly promised to add to this note.

As might have been expected, we went several times to Portland (a drive of an hour and half or more) in pursuit of this little creature, but took only eight specimens altogether between us. *T. subtilella* flies at dusk on favourable evenings for a short time, with an irregular sort of flight, and when it pitches on a stone or leaf, it runs away at a great pace, and causes many an anxious moment before it either disappears from view or is safely housed in a box, round which it still runs with frantic vigour. In consequence of all this motion its condition is not generally very good by the time it is made into a cabinet specimen. I have not observed it flying at night or in the earlier part of the day.

I append a short description of this moth—

Exp. al., $3\frac{1}{2}$—$3\frac{3}{4}'''$. Size (in the eight specimens I have) very constant. Head very hairy, pale reddish-ochreous; eyes black, very conspicuous when the insect is at rest. Fore-wings and fringes shining pale ochreous, with a slight appearance of a darker greyish spot at the tip of the wing, and with the costa at the base also somewhat darker. Hind-wings and fringes very pale greyish-ochreous. Antennæ, legs and thorax pale ochreous, like fore-wings; body more the colour of hind-wings.

The moth bears some resemblance to a very small *T. biselliella*.

Montevideo, near Weymouth:
December 12th, 1890.

[Herr Fuchs first met with this insect July 12th, 1878, at Bornich, in the Rheingau (Rhine district) on the walls of vineyards. Fuchs observes that to catch it with the net was not difficult, but to see it in the net was not so easy, and in the attempt to box it, when in the net, he lost many specimens. On cooler evenings they were less active and sat quietly on the stone walls of the vineyards, and were then more easily boxed (Stettin. Ent. Zeit., 1879, p. 341).—H. T. S.].

ON THE BRITISH SPECIES OF THE GENUS *PITYOPHTHORUS*, EICHHOFF.

BY W. F. H. BLANDFORD, M.A., F.E.S.

The genus *Pityophthorus* was established by Eichhoff in 1864 to include certain small *Tomicidæ*, of which the so-called *Pityophthorus micrographus* of our collections may be taken as an example. Its range was then extended by Thomson and Count Ferrari in order to include those species of *Tomicus* in which the elytra terminate in the male in a pair of hooked spines, and which are devoid of any intercoxal process to the prosternum, namely, *T. chalcographus*, *bidentatus*, and *quadridens*. These insects are, however, quite distinct from the true *Pityophthori*, and were subsequently returned by Eichhoff to the genus *Tomicus*; but they still stand under the former genus in some of our books and collections.

I propose to deal with the *Pityophthori* proper.

This genus, as defined and limited by Eichhoff, presented the following characters:—the antennæ possess a five-jointed funiculus and an oval non-compressed club, which is constricted by transverse sutures dividing it into four distinct joints. The thorax is as long as or longer than broad, bordered at the base, and distinctly narrowed in front. The elytra are cylindrical with simple rows of punctures, and with impunctate interstices; the apex is obliquely truncate, and presents a depression on either side of the suture; it is not armed with spines or teeth, but the raised sides of the apical depression and the sutural margins sometimes possess a row of small setigerous tubercles.

In *Tomicus bidentatus* and its allies the antennal club is tunicate, the basal joint being enlarged and enclosing the apical joints.

Hitherto the only species recorded as British has been *P. micrographus*, Gyll.; this, however, we do not possess, at least, to my knowledge, and the whole of the specimens so called that I have examined are referable to *P. ramulorum* of Perris. To this belong the specimens standing in Stephens' collection under the name of *Tomicus pubescens*, Marsham, and it is almost undoubtedly Marsham's insect. His name should, therefore, have precedence over that of Perris.

The other British species is a much larger insect, which has been taken by Dr. Sharp and others at Braemar, and which stands in some collections under the name of *scoticus*. This is very similar to the continental *P. Lichtensteinii*, Ratz., but is larger. I have little doubt that it will prove a distinct species, but apart from size, the points of difference are slight, and I do not feel justified in introducing it as new without the examination of more specimens than those which Dr. Sharp has kindly entrusted to me. If it turns out to be distinct from *P. Lichtensteinii*, it should stand under Dr. Sharp's MS. name *scoticus*.

These three species (I include *P. micrographus* for the sake of convenience) may be distinguished as follows :—

I. Apex of elytra bluntly rounded, not acuminate.
  i. Apical depressions of elytra wide and deep, their surface glabrous and shining; size larger …… … … …. ……… . *P. Lichtensteinii*, Ratz.
  ii. Apical depressions narrow and inconspicuous, their surface wrinkled; size smaller ……………………………… ……………….*P. pubescens*, Marsh.
II. Elytra acuminate at apex ………………………………*P. micrographus*, Gyll.

PITYOPHTHORUS LICHTENSTEINII, Ratz.
(? *n. sp. scoticus*, Sharp, *in litt.*).

Similar in size and appearance to a small female of *Tomicus bidentatus*; cylindrical, convex, shining, pitchy-brown or black, with disc of thorax and elytra lighter, with very scanty fine pubescence on front and sides of thorax and sides of elytra. Forehead with strong wrinkled punctures, in the male with a fringe of yellow hairs above the mouth, in the female with a dense brush of yellow hair, forming a circular patch in the middle of the forehead. Thorax convex, scarcely longer than broad, strongly narrowed in front; sides straight to middle, thence sinuate to apex, which is strongly rounded, posterior angles distinct but rounded, disc impressed on either side behind middle, covered in front with strong transverse asperations, the posterior half very shining, with somewhat diffuse punctures, deep in male, finer in female, with a broad smooth central line. Scutellum small, depressed, rounded, shining, with two or three hairs on it.

Elytra as wide as thorax and less than twice as long, humeral angles rounded, sides straight to near apex, which is bluntly rounded; moderately shining, with rows of rather deep punctures, interstices impunctate, the inner ones subrugose transversely, especially round scutellum. Sutural stria impressed throughout its length. Apical impressions wide and deep, their fundus very glabrous and shining, their lateral margins abruptly raised and bearing five or six setigerous tubercles, as do the sutural margins, which are slightly raised at the apical declivity. Under-side thinly pubescent. Femora and tibiæ pitchy-brown, tarsi and antennæ testaceous.

Length, 2—2·2 mm.

Hab.: Braemar, Scotland.

The points in which this appears to me to differ from the continental *P. Lichtensteinii* are its greater size, the more abundant and yellower frontal pubescence, the greater narrowing of the thorax in front and its sparser and less rugose punctuation behind.

PITYOPHTHORUS PUBESCENS, Marsham, Stephens.

Ips pubescens, Marsh., Ent. Brit. Col., p. 58 (1802).
P. ramulorum, Perris, Ann. Fr., 1856, p. 192.

Somewhat elongate, obscure fuscous-brown, shining, with thin grey pubescence, antennæ and legs testaceous, femora and tibiæ with fuscous tinge. Head in female with a conspicuous brush of grey-yellow hair. Thorax as long as broad, narrowed in front with apex rounded, asperate in front, behind shining, with large deep punctures and smooth central line. Elytra cylindrical, with conspicuous rows of strong punctures; the interstices with slight transverse wrinkles. Sutural stria not depressed, suture slightly raised at apex with a narrow, somewhat rounded, depression on either side, whose lateral walls are only slightly raised, and are punctured by the continuation of the lateral striæ of the elytra, without conspicuous setigerous tubercles. Length, 1·3—1·5 mm.

Commonly distributed in fir woods in the South of England, Shirley, New Forest, &c.

Similar to the foregoing species, but much smaller, without impressed sutural striæ, and without the deep and wide apical impression or its marginal tubercles.

PITYOPHTHORUS MICROGRAPHUS, Gyll.

Elongate cylindrical, reddish or pitchy-brown, moderately shining. Antennæ and legs reddish-brown. Thorax longer than broad, hardly narrowed in front, apex bluntly rounded, anterior exasperations concentrically disposed, punctuation of hinder part fine and scattered. Elytra produced at apex, not obtusely rounded, with fine punctuation. The apical depressions distinct, deep, rather dull, their outer margins raised, convex, shining, without punctures, but with distinct setigerous tubercles, as have the raised sutural margins. Length, 1·3—1·5 mm.

I know of no authentic British specimens. The species is especially attached to the spruce fir.

Its longer shape, brighter colour, and finer punctuation will distinguish it from either of the other species, as will the acuminate elytra.

In the identification of the sexes I follow Eichhoff's views in his "Europaïschen Borkenkäfer" (Berlin, 1880). He there reversed his earlier opinion, which agreed with Thomson's, in accordance with observations and dissections whic he had recently made.

The species of *Pityophthorus* can be taken in localities where they occur by examining the smaller terminal joints and branches of Conifer brushwood. Most species breed in these, and do not touch the bark of large branches. *P. micrographus* is, however, an exception.

The three species of *Tomicus* mentioned above have been again separated from that genus by M. Bedel, and placed in a new genus, *Pityogenes*, distinguished from *Tomicus* by the absence of a prosternal process. *Pityogenes chalcographus*, Linn., and *bidentatus*, Herbst, are well known species; *P. quadridens*, Hart., is less known, and its place is sometimes supplied by examples of *P. bidentatus*. It is a distinctly smaller insect, the punctuation of the thorax is finer and more scattered. The male has four distinct teeth at the apex of the elytra, two at the summit of the apical declivity, which are large and hooked, and two rather more than half-way down it, but not as far down as the apex, the border between these two teeth is not crenulate, and is quite devoid of setigerous tubercles, which are always present in *P. bidentatus*. The female has four small tubercles in the situation of the male teeth.

48, Wimpole Street, W.:
November, 1890.

ON THE OVIPOSITION OF *METŒCUS* (*RHIPIPHORUS*) *PARADOXUS*.

BY T. ALGERNON CHAPMAN, M.D.

It is now some twenty years since I made a slight addition to our knowledge of the life-history of this interesting species. I was then obliged to leave undetermined the whole question of the oviposition, of the hatching of the young larva, and its means of reaching the wasps' nest. In this long interval I have, as opportunity occurred, made various efforts to clear up some of these points; but it was not till this year that I made any further advance: so far as I have heard no one else has done anything in the matter. As my observations this year only throw a partial light on the still obscure questions, I had some idea of waiting till they were more complete before saying anything about them; but I reflected that possibly another twenty years might elapse before making another step, and the appearance of the part of Mr. Fowler's *Coleoptera* dealing with the species making it seasonable, I submit this note.

Failures are often as instructive as successes, and have, in this case, led up to the trifling success I have at length reached, so that I am sorry to have kept no record of what I did in the matter at various times in recent years. I did, however, obtain examples of the beetle in greater or less numbers, and treated them in various ways, placing with them earth, sand, various plants, flowers, &c., but always with the result that in a few weeks at furthest they died, without either ovipositing or showing any desire to hibernate. I, however, came to, or was confirmed in, the conclusion that the eggs were laid in autumn, and that the beetles did not hibernate, partly from the death of the beetles, partly from the females always being full of eggs fully matured. I have never succeeded in finding a free larva in the wasp's nest, whence I conclude that they are introduced one by one, and very quickly bury themselves in a wasp grub; whereas, did the beetle hibernate, the female would lay many eggs in a nest, and the young larvæ would certainly be often met with. The female contains so many ova (though not so many as *Meloë*) that it is obvious that the great mortality of the species occurs between oviposition and the safe arrival of the larva into the interior of the wasp grub, especially as after that date the mortality is nil. If the egg were laid in the nest this would not be so.

Thinking out these matters, I this year enclosed a number of freshly disclosed beetles in a sunny place, with portions of dead and rotten wood, as well as some flowers. I was lucky enough on two occasions to see the beetles *in cop.*, proving certainly that pairing occurs in autumn, and afterwards I observed several females, fertile or otherwise, searching the crevices of the wood with their extensive ovipositors, and at times quietly resting with the ovipositor nearly out of sight, buried in the cracks of the wood. This clearly proves that the eggs are laid in autumn.

That a cavity in dead or rotten wood is the natural place of oviposition is not proved, but is rendered in the highest degree probable, when it is remembered that no other arrangement that I previously tried had any success in inducing oviposition. It becomes further, therefore, probable that the mite-like young larvæ are met with by the wasps in collecting the wood shavings for nest building, probably usually one at a time, and a nest contains a succession of *paradoxus*, because the same post or stick over which the beetle larvæ are wandering, is constantly frequented by the wasps of that nest, whilst those of other nests, free from *Rhipiphorus*, do not happen to have visited such a post. Though my observations will well bear refutation or confirmation, there remains really only one matter still unknown, that is, when do the eggs hatch? From the delicate nature of the eggs I incline to believe that the young larva is developed in the autumn, but hibernates unhatched within the egg-shell. Those eggs that I found laid in the wood cavities were either infertile or injured by my examination, as they went mouldy instead of developing. Whether any I did not disturb may have been more lucky will not appear till next spring, but I much doubt it.

The eggs are spindle-shaped, 0·47 mm. long and 0·2 mm. in diameter, of a pure milk-white, and are laid somewhat irregularly, but with a tendency to be packed closely side by side. Mr. Fowler appears to entertain the idea that the egg is laid in the wasp cell; this may justify my stating two reasons why this would be extremely improbable, even if I had not otherwise rendered it practically certain that the actual habit is very different. First, a personal reason; I have met with hundreds of *Rhiphiphorus* in all stages, only once as a free larva, but abundantly within the wasp larva, and at all stages forward to the perfect beetle, but have never seen any indication of an egg within the cell. Secondly, the wasp develops with extreme rapidity, yet the *Rhipiphorus* keeps up with it, or, indeed, overtakes it; there would thus be really no time for the development of the young larva within the egg, even were it as rapid as is at times the case in *Chrysis*. The nature of the ovipositor, egg, and young larva, nevertheless, plainly indicates that the larva must take some time to mature in the egg, and that the species is not viviparous.

Firbank, Hereford:
November, 1890.

NOTE ON A NEW *CICINDELA* FROM NORTH JAPAN.

BY G. LEWIS, F.L.S.

Cicindela aino, *n. sp.*

C. niohozana *simillima, supra cupreo-fusca. Elytris, puncto humerali et post humerali, fascia flexuosa media, lunula apicali albis; labro albo transverso.* ♀. *Length*, 16 *mm.*

This species is the size of and very similar to *C. niohozana*, Bates, but it is darker in colour and has the labrum much shorter and more transverse. The elytral markings are similar in both species at the humeral angle and in the spot below the shoulder, but the median fascia in *C. aino* is less angulate in the centre, and the apical marking is not a circular disc, but a crescent embracing the tip of the wing-case like that seen in *C. Lewisi*, Bates. The thorax is somewhat quadrate, as in *C. niohozana*. *Cicindela sachalinensis* and *Raddei* also belong to this group.

I am much indebted to Mr. Bates for the intimation, after a careful examination of the specimens, that the species has not until now been described.

Hab.: Yezo and Saghalin. I have two female examples from the Ishikari River in Yezo, and Mr. Bates has one from Saghalin.

Folkestone: *November*, 1890.

Micropteryx Kaltenbachii on hornbeam.—Mr. Machin has handed me for examination a very perfect specimen of a curious (very purple) *Micropteryx*, reared by him this year. It proves, on examination, to be of the species recently described by Mr. Stainton, and reared by Dr. Wood from leaves of hazel—*Kaltenbachii.* Mr. Machin tells me that he found about twenty mines containing larvæ on leaves of hornbeam (*Carpinus betulus*) in the first week of June, 1889, in the neighbourhood of Ongar Park Wood, Essex. One specimen of the moth was reared at the end of March. The occurrence of this species in a new locality, and on a different (though allied) food plant, is of great interest.—Chas. G. Barrett, 39, Linden Grove, Nunhead, S.E. : *November 24th*, 1890.

Another Plusia moneta at Dover.—My friend Mr. Webb informs me that another *Plusia moneta* has been captured at Dover, a smaller and darker specimen than that previously recorded. It flew into a bedroom window in the Maisondieu Road and settled on the dressing table, about 6 or 7 o'clock in the evening of September 20th. Fortunately it fell into appreciative hands. This is clearly a specimen of the second brood, probably having fed as a larva in some neighbouring garden. Its occurrence is most interesting, as increasing the probability of the continuance of the species in this country.—Id. : *December*, 1890.

Plusia moneta, and its geographical distribution.—With great interest I have read the announcement of the occurrence of *Plusia moneta* in Great Britain (Barrett, Ent. Mo. Mag., 1890, 255) ; this species being a very good example of the great changes which may take place in the geographical distribution of an insect. The tendency of moving in the direction from east to west, which we find, or suspect, in so many other European insects is expressed clearly in this species, and has been noticed for some years by continental entomologists.

Plusia moneta was known to be a common insect in the south and south-east of Germany, but until the year 1875, was not recorded from the north-west of our country, nor from the Netherlands.

In the year 1875 began the invasion of the species into the above-named districts, and in the course of a few years it was recorded from different places : Rhoden, Arolsen (Speyer), Hanover (Wacquand), Mecklenburg, Stralsund (Schmidt), Hamburg (Græser). In the year 1882, it was found near Arnhem, and in 1887, near Breda, in Holland (Snellen).

The tendency of the species to gain new ground was so intense, that even the rough climate of our Harz Mountains was not able to keep it back, for I found *moneta* in the moorland districts of the Brocken, at about 800 mètres ; I noticed the larva there during three years from 1879 on the *Aconitum* plants, in a small garden belonging to a forester's house. The species was single-brooded there, whilst it is double-brooded in more favourable climates.

Now, the species having crossed the Channel, it will probably spread as rapidly over England as it has done over the north-west of Germany, and over Holland.

Tke larva may be easily noticed, when young, in May, on the aconite, spinning the young shoots of the plant together, like the larvæ of several *Depressariæ.* Later, the large yellow cocoon is easily visible hanging on the under-side of a leaf of aconite.

The most interesting question is, whether *Plusia moneta* will keep the newly-gained ground, or whether it will lose it again in the course of years.—AUGUST HOFFMANN, Devrientstrasse, 3, Hanover, Germany: *November 27th*, 1890.

Description of the larva of Lithocolletis anderidæ, Fletcher.—At the kind invitation of the Rev. O. P. Cambridge, Mr. E. R. Bankes and I went to stay with him at Bloxworth for a few days at the end of October last to look for mines of *Lithocolletis anderidæ*.

We found a good many mines in the birch, but from the size and general appearance of most of them, I fear that we, or I at all events, have chiefly been successful in collecting *L. ulmifoliella*. I have, however, some mines which I feel sure are those of *L. anderidæ*, and a few of these I have sacrificed in order to describe the larva of this species, which I found no difficulty in distinguishing from *ulmifoliella*, as will be seen by the following description:—

Length, 1¾ lines. Head almost black towards the sides, with the central part light grey, and two longitudinal blackish lines proceeding to the mouth from a point near the top; tips of jaws and palpi reddish-brown. Body uniformly yellowish-green, rather transparent. Legs almost transparent, with inconspicuous grey rings at the joints. When first taken from its mine the dorsal vessel is bright green, owing to the presence in it of undigested food, and this gives the larva the appearance of being greener than it really is. As the food passes through the colour of the larva seems to fade until it is decidedly more yellow in tint, the dorsal vessel being still a little darker. A few almost colourless hairs are perceptible under the microscope. The head is slightly narrower than the last segment, and not more than half the width of the 2nd, 3rd and 4th segments, which are considerably larger than the rest, and present a swollen appearance, the 3rd segment being the widest of all. The 5th segment is distinctly narrower than the 4th, and the body thence is cylindrical to the 9th segment inclusive, whence it tapers very slightly to the end.

This larva may be distinguished from that of *L. ulmifoliella* by its smaller size and more slender appearance, and by the absence of the yellow spot, which is so conspicuous (until the larva is about to change to pupa, when it is merged in the opaque yellow colour, which the whole body then assumes) on the 9th segment of *L. ulmifoliella*. It does not make even a slight cocoon like *ulmifoliella*, and the mine is smaller (see 1890, p. 243). The pupa is brown, and rather less than 1½ lines in length.—NELSON M. RICHARDSON, Montevideo, near Weymouth: *Nov. 12th*, 1890.

A query as to hibernation.—Of those insects that hibernate in the perfect state some are fertilized in the autumn and only the females survive the winter; others are fertilized in the spring, both sexes passing through the winter. In the Aculeate *Hymenoptera* the former appears to be the rule, obtaining in *Vespa*, *Bombus*, *Apathus*, *Halictus*, and also in honey bees and ants, so far as they can be regarded as hibernating rather than as perennial, that is, the fertile ♀ survives the winter, the ♂ does not. Are there any instances known of the male hibernating in Aculeate *Hymenoptera*? In *Lepidoptera* both sexes survive the winter, and fertilization takes place in the spring. I know this to be so in *Gonepteryx rhamni*, *V. urticæ*, *Io*, *Atalanta*, *c-album*, *G. vaccinii* and (*spadicea*?), *S. satellitia*, *S. libatrix*, *Xylina* *rhizolitha*, and *petrificata*, *Calocampa* (both), *H. croceago*, *S. dubitata*, *C. miata*, *Alucita*, and some *Depressariæ*. It would be desirable to extend the lists both in *Hymenoptera* and *Lepidoptera*, and especially to ascertain whether there are any exceptions to these apparent rules. If not absolutely, they are very broadly true. As to other Orders I have made fewer observations, and have not noted that many have been specially recorded. I believe no *Tenthredo* hibernates as an imago. As to Ichneumons, I learn from Mr. Bignell that their habits are very various, and in some species have that indeterminate character (or "fluidity") that I refer to as common among *Coleoptera*. Not a few hibernate as imagines, but the date of fertilization is not recorded; the capture of hibernated males in the spring, or their absence, would be strong, if not perfect, evidence as to this point. Among *Coleoptera* many species pass the winter more or less awake rather than hibernate. Many others, as the *Hylesinids*, ought not to assume the perfect state till spring, but a large proportion do so in autumn; these individuals hibernate and pair in spring; there is, indeed, among beetles a great apparent fluidity of habit, with no very defined date for any stage to the degree we are used to in *Lepidoptera*.

When do those beetles pair whose habit is like that of many weevils, take *Anthonomus pomorum* as a type, which emerges in June or July and do not oviposit till the following April, or even May?

The common *Coccinellæ*, *Dryops femorata*, and one or two others that truly hibernate, pair in the spring; records of many others must exist.

To return, however, to the *Hymenoptera* and *Lepidoptera*, where we are on more fully explored ground, what is the reason for so decided a difference of habit?

It would seem that there was an advantage in autumn fertilization to this extent, that there is probably always an unfertilized residuum, which must be in proportion to area. Say that one ♀ per square mile represents, for a particular species, a sparseness of distribution in which she fails to be found by the ♂, and that this number (more or less) always remains unfertilized, this represents a loss that must be much larger proportionately in the spring, when perhaps half the individuals of the species have succumbed to the perils of hibernation, it will, indeed, in that case be twice as great a loss as it would have been in autumn; but, in a specially disastrous winter in which, say, nine-tenths of the species have perished, it will be ten times the loss. The number that fails to be fertilized being an absolute and not a proportional number.

It is also possible to suppose that in the case of autumn fertilization, only half the number of individuals having to survive, suitable hibernacula will be more easily found, being proportionally twice as abundant, though probably suitable places for wintering in are always in large excess of any requirements.

If these advantages of autumn fertilization have led the *Hymenoptera* to adopt that system, why have the *Lepidoptera* taken the opposite course? I do not think anything can be made of the weather being more suitable in spring.

There is room for much doubt whether there is any actual effect produced by any possible advantage in either case, and whether the difference is not existing in the natural habit of the two Orders. In Aculeates there is possibly (there certainly is in *Apis mellifica*) a necessity for fertilization occurring within a brief period after exclusion; whilst, as seen in various ants and bees, the fertilized ♀ may live many months or years. On the other hand, in *Lepidoptera* the necessity of egg laying as soon as possible after fertilization is often great, and delay in fertilization is more easily suffered than delay in oviposition afterwards.—T. A. Chapman, Hereford: *October*, 1890.

Megacronus inclinans and Agabus guttatus near Hartlepool.—On October 12th, 1890, I took three specimens of *Megacronus inclinans* upon the sand hills between Hartlepool and Hesleden Dene Mouth. It was a beautiful sunny afternoon, and beetles literally swarmed; had it been possible for the whole ground to have been gone over to Black Hall Rock, doubtless many more good species would have been secured, as it was a day in a hundred for the time of year. On November 8th, after heavy rains, I took no less than 130 specimens of *Agabus nitidus* under stones and flood refuse, upon the sands at the mouth of the stream running out of Hesleden Dene; they had evidently been washed down by the flood, and taken temporary refuge under the first convenient shelter. It is somewhat strange that only one *guttatus* was taken.—J. Gardner, Hartlepool: *December*, 1890.

The marine caddis-fly of New Zealand.—In the "Transactions of the New Zealand Institute," vol. xxi, 1888 (1889), there is a paper by Mr. Geo. M. Thomson, F.L.S., on New Zealand *Crustacea*, and at p. 260 are some remarks on the Amphipod, *Corophium contractum*, Stimpson, to the following effect:—"When collecting on the shores of Auckland Harbour, between tide-marks, I picked up a small tube about 6 mm. long, closed at one end and furnished with a hinged lid at the other end, which at the time I took to be the case of a marine caddis-worm. The tube was made of very tough material, and was covered over with fragments of corallines, so that had I not seen it moving, I should have passed it by. On opening it the tube was found to contain a small specimen of *C. contractum*, but whether the Crustacean constructed the tube, or, which is more likely, had merely found it empty and had taken refuge in it, could not be decided."

This tube is figured on pl. xiii, fig. 2, and coincides so precisely with that of *Philanisus*, "a marine caddis-fly," the habits of which were described and figured by me in the "Journal of the Linnean Society," Zoology, vol. xvi (1882), that I have no hesitation in referring it to that genus, and agree with the suggestion that the Crustacean had simply utilized it, but it may possibly have previously devoured the rightful inmate. I have used the term "*The*" marine caddis-fly, because at present we are without evidence that more than one species of marine habits exists in New Zealand.—R. McLachlan, Lewisham, London: *November 27th*, 1890.

Rare Aculeate Hymenoptera in Devon.—*Myrmecina Latreillei*, ♂, beaten from high oak hedge on one occasion in a lane near Tavistock; September 27th, 1890. *Myrmosa melanocephala*, ♀, running up vertical bank in hot sun on road leading from Morthoe to beach; in the same bank were species of *Halictus* and *Sphecodes* burrowing, also a fine specimen of *Chrysis bidentata*, ♀; August 3rd, 1890. *Methoca ichneumonoides*, ♀, running on rocks at Morte Point, Morthoe, almost in reach of spray; August 1st, 1890. Mr. Saunders has kindly verified the names of the insects. —Harold Swale, Tavistock: *November 11th*, 1890.

"*L'Abeille.*"—By the will of the late Abbé de Marseul this publication became the property of the Entomological Society of France. The Society has decided to continue it, under the editorship of M. L. Bedel. As heretofore, it will be mainly devoted to memoirs on the *Coleoptera* of the Old World. Each volume will consist of 12 parts of 24 pages each, and the subscription is fixed at 10 francs to Members of the Society and 12 francs to others. We would suggest that the original form (12mo) of the journal was inconveniently small.—Eds.

Societies.

Birmingham Entomological Society: *November 17th*, 1890.—Mr. W. G. Blatch, F.E.S., President, in the Chair.

Mr. M. Stanger Higgs was elected a Member of the Society.

Mr. H. M. Lee showed *Calocampa vetusta*, *Scopelosoma satellitia*, &c., from Sutton Park. Mr. P. W. Abbott showed a fine series of *Tapinostala fulva* taken in Sutton Park, flying at night in the company of *Nonagria arundinis.* Mr. R. C. Bradley showed two varieties of *Abraxas grossulariata.* A discussion followed on the causes of colours in insects, in which Messrs. W. G. Blatch, C. F. Thornewill, R. C. Bradley, and C. J. Wainwright joined. Mr. C. J. Wainwright showed several wings of *Selenia tetralunaria* denuded of scales, one of which lacked half of one longitudinal vein; a discussion followed, in which Messrs. Blatch, Thornewill, and Wainwright joined. Mr. Blatch mentioned a curious case of a specimen of *Habrostola urticæ*, which had the body filled with scales like those on the wings. Rev. C. F. Thornewill showed a collection of *Lepidoptera* made at Abbott's Wood in June, 1890, and made remarks on them.

December 1st, 1890.—The President in the Chair.

Mr. W. G. Blatch reported that during 1890 he had taken sixty species of beetles new to the Midlands. Messrs. C. F. Thornewill, R. C. Bradley, W. Harrison, G. W. Wynn, and A. Johnson showed collections of insects taken during 1890. Mr. Thornewill's included a specimen of *Scotosia certata*, taken on September 8th, and seeming, therefore, to point to a second brood of the species. Mr. G. T. Baker showed a collection of Madeiran butterflies. Mr. C. J. Wainwright showed *Cosmia affinis* and *diffinis* from near Bromsgrove.—Colbran J. Wainwright, *Hon. Sec.*

Lancashire and Cheshire Entomological Society.—The monthly meeting was held on Monday, December 8th, 1890, in the Free Library, the President (Mr. S. J. Capper, F.L.S.) in the Chair.

Mr. B. H. Crabtree was elected a Member.

Mr. R. Newstead, F.E.S., read a paper on "British Wasps: their parasites and scavengers;" in which he gave the life-history of the wasp, from the commencement of the nest by the single queen, to the complete formation of the colony, and enumerated twenty-two species of insects, which he had found inhabiting these nests; the paper was fully illustrated with specimens and diagrams. The President exhibited *Acidalia immorata* from Lewes. Mr. Gregson, cases of *Articulata*, showing manipulation before being presentable at private and public museums. Mr. Sydney

Webb, his two specimens of *Plusia moneta.* Mr Bescherner, foreign *Papilios.* Mr. Stott, a very variable series of *Charæas graminis.* Mr. P. Schill, *Parnassius Apollo* and *P. Phœbus*, with specimens of *Papilio Machaon*, showing the marked difference between English and foreign specimens.—F. N. Pierce, *Hon. Sec.*, 143, Smithdown Lane, Liverpool.

Entomological Society of London: *December 3rd*, 1890.—The Right Hon. Lord Walsingham, M.A., F.R.S., President, in the Chair.

Mr. John Gardner, of 6, Friar Terrace, Hartlepool; and Mr. Samuel James Capper, F.L.S., of Huyton Park, Liverpool, were elected Fellows of the Society.

Dr. D. Sharp exhibited specimens of *Papilio Polites*, *P. Erithonius*, and *Euplœa Asela*, received from Mr. J. J. Lister, who had caught them on board ship when near Colombo, in November, 1888. Dr. Sharp read a letter from Mr. Lister, in which it was stated that from the ship hundreds of these butterflies were seen flying out to sea against a slight breeze. Many of them, apparently exhausted by a long flight, alighted on the deck of the ship, and large numbers perished in the sea.

Lord Walsingham exhibited a coloured drawing of a variety of *Acherontia Atropos*, which had been sent to him by Mons. Henri de la Cuisine, of Dijon. He also exhibited specimens of an entomogenous fungus, apparently belonging to the genus *Torrubia*, growing on pupæ, received from Sir Charles Forbes, and which had been collected in Mexico by Mr. H. B. James. Mr. McLachlan expressed an opinion, in which Mr. C. O. Waterhouse and Mr. G. C. Champion concurred, that the pupæ were those of a species of *Cicada*. Mr. F. D. Godman said that at the meeting of the Society on the 3rd October, 1888, he had exhibited a larva of a *Cicada* with a similar fungoid growth. The specimen was subsequently produced, and the fungus proved to be identical with that on the pupæ shown by Lord Walsingham.

Mr. R. Adkin exhibited male specimens of *Spilosoma mendica*, Clk., bred from ova obtained from a female of the Irish form which had been impregnated by a male of the English form. These specimens were of a dusky white colour, and were intermediate between the English and Irish forms.

Mr. F. Merrifield showed samples of a material known as "cork-carpet," and explained its advantages as a lining for cabinets and store-boxes. Dr. Sharp fully endorsed the opinion expressed by Mr. Merrifield.

Mr. R. W. Lloyd exhibited specimens of *Anisotoma Triepkei*, Schmidt, and *Megacronus inclinans*, Er., collected last August at Loch Alvie by Aviemore.

Mr. Merrifield read a paper, entitled, "On the conspicuous changes in the markings and colouring of *Lepidoptera* caused by subjecting the pupæ to different temperature conditions;" in which it was stated that the results of many experiments made on *Selenia illustraria* and *Ennomos autumnaria* tended to prove that both the markings and colouring of the moth were materially affected by the temperature to which the pupa was exposed: the markings by long continued exposure before the last active changes; the colouring, chiefly by exposure during these last changes, but before the colouring of the perfect insect began to be visible, a moderately low temperature during this period causing darkness, a high one producing the opposite effect, and two or three days at the right time appearing in some cases sufficient. Dryness or moisture applied during the whole pupal period had little or no effect on either markings or colouring. Applying the facts thus ascertained, Mr. Merrifield said he had obtained from summer pupæ of *illustraria* some moths with summer colouring and spring markings, some with spring markings and spring colouring, and some with summer markings, but an approach to spring colouring. These specimens, with enlarged and coloured photographs of them, were exhibited.

Mr. C. Fenn, who said he did not agree with Mr. Merrifield's conclusions, exhibited a very long and varied series of specimens of *Ennomos autumnaria*, all of which, he stated, had been bred at the same temperature. He expressed an opinion that the presence or absence of moisture, rather than differences of temperature, was one of the principal causes of variation. The discussion was continued by Lord Walsingham, Colonel Swinhoe, Mr. Waterhouse, Mr. Jenner Weir, Mr. Elwes, Mr. McLachlan, Mr. Porritt, Dr. Mason, Mr. Barrett, and others.

Mr. G. T. Baker read a paper, entitled, " Notes on the *Lepidoptera* collected in Madeira by the late T. Vernon Wollaston." The paper was illustrated by a number of figures drawn and coloured some years ago by Prof. Westwood.

Mr. Hamilton H. Druce exhibited several very beautiful species of butterflies, belonging to the genus *Hypochrysops* from the Solomon Islands and Australia, and read a paper on the subject, entitled, " A Monograph of the Lycænoid genus *Hypochrysops*, with descriptions of new species."

Mr. C. J. Gahan read " Notes on some species of *Diabrotica*."—H. Goss and W. W. Fowler, *Hon. Secretaries.*

ON THE BRITISH SPECIES OF THE GENUS *CICADULA* (ZETT.), FIEBER.

BY JAMES EDWARDS, F.E.S.

As originally constituted by Zetterstedt, this genus comprised, besides the insects the subject of this paper, the genera *Gnathodus*, *Eupteryx*, *Typhlocyba*, *Dicraneura*, &c. In 1871, Dr. J. Sahlberg restricted the use of the term *Cicadula*, and for him it was equivalent to the Fieberian genera *Kybos* and *Chlorita*. Fieber, in his "Katalog" (1872), appropriated the term for that group of small Jassids in which the outer branch of the cubital nerve becomes obsolete soon after leaving the base of the elytron, or, at all events, does not reach the angular nerves, while the first wing-nerve, and the upper branch of the second, are either connected by a transverse nerve, or very shortly confluent at some distance before the apex.

Seeing that Sahlberg had already appropriated the same term for certain of the components of the original genus of Zetterstedt, it would have been better had Fieber invented a fresh name for the group which he wished to characterize; but as Dr. Puton, in his Catalogue, follows Fieber in the use of the name, it is expedient that the same course should be adopted here.

In my Synopsis of British *Cicadina* I have followed Dr. Sahlberg, and considered the group as a section of *Limotettix*, but having lately become acquainted with a greater number of the described species, I now think that it will be best to treat it as a distinct genus, characterized by the neuration of the elytra and wings. A French translation of Fieber's work on the genus, with valuable additions by M. Lethierry, is published in the Revue d'Entomologie for 1885; the late Mr. Scott, too, has a paper on the genus, which is chiefly useful to the student for the detailed description of *C. frontalis*, at page 231 of vol. xi of this Magazine. From the description of Fieber's *C. frontalis*, published in 1885, it is clear that his insect is not identical with Scott's insect of the same name, as the former seems to have imagined. Scott's description having been published ten years prior to that of Fieber, a new name for the latter's insect becomes necessary, and I have, therefore, called it *C. Fieberi.*

The most obvious feature of the genus is the evanescence of the upper branch of the cubital nerve, a peculiarity which is shared by *Gnathodus*, but in the latter the first wing-nerve and the upper branch of the second coalesce before the apex of the wing, and thus run into the marginal nerve. In all the species that I have been able to examine, the ædeagus is formed on the same plan, namely, a subterete, more or less tapering base, supporting a pair of slender pointed arms, which in *C. metria* only are unequally bipartite; the last named species is aberrant also in the form of the genital plates, which are nearly flat throughout, and obliquely truncate at the apex, and the pygofer projects beyond the plates for a distance nearly equal to their entire length; in the other species they are abruptly narrowed at a distance from the apex, varying from about one-half to one-third of their entire length, the narrowed portion is bent upwards, and wants the long white cilia which clothe the outer margin of the horizontal portion of the plate, and the pygofer does not project for any appreciable distance beyond the apex of the plates.

In these insects, as in many other *Cicadina*, the form of the ædeagus affords the most constant structural specific character. and I have, therefore, given outline figures of that organ in several of the species; at present it is only necessary to have recourse to this part for the separation of species in the case of otherwise doubtful examples of *C. 6-notata* and *C. Fieberi*; but in view of the probable existence of species otherwise perfectly distinct, but closely resembling those already described in general appearance, the diagnosis of a *Cicadula*, which does not give an account of the ædeagus, cannot be expected to stand.

I have not been able to examine types of either *C. fasciifrons* or *C. opacipennis*, and in their absence it is impossible to be certain that the insects here called by those names are identical with the insects from which the descriptions of those species were taken by their respective authors; but, judging from description, it seems probable that they are so, and I have, therefore, thought it better, instead of creating fresh names, to adopt those of Stål and Lethierry respectively, leaving the question of the identity of our insects with theirs to be absolutely decided hereafter by some one enjoying the requisite facilities for the purpose. With regard to *C. opacipennis*, M. Lethierry is of opinion that our insect is a variety of that species, although he cannot say for certain, as the species was described from a single example which belonged to M. Jakowleff.

The following is a table of all the species at present known to me as occurring in Britain :—

1 (4) The two subocellar black spots wanting.
2 (3) Frons without transverse dark lines; crown as long or longer than its basal width .... 1. *metria*, Flor.
3 (2) Frons with more or less distinct brown transverse lines; crown about one-third shorter than its basal width .... 2. *opacipennis*, Leth.
4 (1) Subocellar black spots present (frequently confluent with each other and the adjacent markings).
5 (10) Frons without black transverse lines.
6 (7) Frons with a black spot just above the clypeus ....3. 7-*notata*, Fall.
7 (6) Frons without a black spot at the apex.
8 (9) Subocellar spots below the ocelli; crown with two large præbasal spots... 4. *variata*, Fall.
9 (8) Subocellar spots behind the ocelli; præbasal spots of the crown wanting or punctiform ....5. *punctifrons*, Fall.
10 (5) Frons with more or less confluent black transverse lines, or entirely black.
11 (12) Subocellar frontal spots each composed of two short parallel curved lines 6. *fasciifrons*, Stål.
12 (11) Subocellar spots entire, or confluent with the adjacent markings.
13 (16) Markings of crown and frons, as a rule, distinct.
14 (15) Size larger; curvature of front and hind margins of crown subequal, nearly all the areas of the elytra filled up with brown... 7. *frontalis*, Scott (♀).
15 (14) Size smaller; crown very distinctly longer in the middle than at the sides; elytra generally subdiaphanous, pale greenish-grey; convexity of the curve of the arms of the ædeagus beneath...8. 6-*notata*, Fall.
16 (13) Subocellar spots merged with the interocular line, and frequently with the basal markings of the crown and the black lines on the frons also, so that the crown and face appear entirely black, or black with a few yellow markings.

17 (18) Size smaller; elytra greenish-grey, with or without brown or piceous markings; convexity of the curve of the arms of the ædeagus above... 9. *Fieberi*, n. sp., *frontalis*, Fieb.

18 (17) Size larger; entire upper-side pitch-black, with a bluish tinge; the first transverse nerve, and those immediately adjoining it, frequently forming a kind of pale H near the base of each elytron ...10. *cyanæ*, Boh.

Of these, *metria*, 7-*notata*, *variata*, and 6-*notata*, are our well-known species of those names; *opacipennis*, *punctifrons*, *fasciifrons*, and *cyanæ*, are new to Britain, and *Fieberi* is practically so, although it was described by Fieber from specimens sent to him by Mr. Scott under the name of 6-*notatus*. In point of facies, *frontalis*, *fasciifrons*, 6-*notata*, and *Fieberi* form a natural group, and to the same group *cyanæ* and *opacipennis* evidently belong, the former illustrating an extreme development of the dark markings; and the latter, in the majority of specimens, their entire absence. In the group just mentioned, the normal black markings of the head are a pair of round or roundish basal spots, an interocular line more or less widely interrupted in the middle, and a pair of large spots on the forehead, the latter clearly representing the coalescence, vertically, of the widely interrupted interocellar and infraocellar lines, as presented in *C. fasciifrons*, where, with the exception of some highly coloured males, they retain their separate character. The remaining four species are very distinct in appearance. As before remarked, *C. metria* is somewhat aberrant in the external male characters, but as it agrees with the other species in contour, and the neuration both of elytra and wings, it seems undesirable to create a new genus for its reception. This interesting species has been much misunderstood, being placed by Fieber, Sahlberg, Scott, &c., in the genus *Deltocephalus*. *C. frontalis*, Scott, is a good species, allied in the form of the crown to *C. punctifrons*, Fall.; it may be easily distinguished from our other species with the crown-markings of the 6-*notata* pattern by its superior size, and the entire absence of angulation in the outline of the front margin of the crown; so far as I know, it has not been taken in Britain since the capture of the original specimens by the Rev. T. A. Marshall in a swampy place near Lastingham in September; the male is still undescribed, but I have a strong opinion that a male *Cicadula* from Chamounix, sent to me by Dr. Puton as representing what he considered to be *C. frontalis*, Fieb., belongs here.

The colour-characters are best seen in highly coloured males, and as the more difficult species (6-*notata* and *Fieberi*) are highly gregarious, there will generally be no difficulty in securing some of these in each gathering and in deciding to which type of coloration the majority of the specimens belong; it is perfectly useless to attempt to identify solitary females of the two species last named.

I append descriptions of those species of which no English description has hitherto appeared; the measurements used are actual, not estimated, quantities.

CICADULA OPACIPENNIS, Leth. (?).

C. opacipennis, Leth., Ann. Soc. Ent. Belg., xix; Bull., 83; in Fieber's Cicad. d'Eur. (*Cicadula*), 53.

Crown, pronotum, and scutellum, yellow, the former sometimes with two punctiform black spots, which are nearer to the hind than the front margin, and about equidistant from each other and from the eyes. Elytra sordid greenish-grey. Crown: in the male, one-third shorter than the pronotum, one-third longer in the middle than at the sides, its free sides nearly straight, apex obtuse; in the female, one-fourth shorter than the pronotum, one-third longer in the middle than at the sides, free sides arcuate, apex broadly rounded; frons generally with a few fuscous side lines, infraocellar line rarely developed, and then biarcuate and more or less widely interrupted in the middle. Elytra subopaque, with slightly paler nerves, but without fuscous streaks or other markings. Abdomen: above black, narrowly pale at the sides; beneath, black, with pale hind-margins to the segments. Ædeagus as in figures *n* and *o*. Legs pale, front tibiæ with a dark line, hind tibiæ with black points. Length, 3¼—3¾ mm.

Ranworth, Norfolk; in very wet places, September 18th, 1890.

This is, without exception, the most agile Cicadine that I know.

Cicadula punctifrons, Fall.

Cicada punctifrons, Fall., Hem. Suec., ii, 42, 26.

Limotettix punctifrons, J. Sahl., Not. Fenn., xii, 244, 16.

Crown yellow, with a large round black spot adjoining the hind-margin of each ocellus, sometimes there is a black point on each side of the hind-margin, about equidistant from the central line and each eye, and an irregular, generally subgeminate, dark spot in the middle of the front margin; in the male, subequal in length to half its basal width, one-half shorter than the pronotum, a little longer at the sides than in the middle; in the female, one-third shorter than the pronotum, one-fourth longer in the middle than at the sides, its free sides gently arcuate, apex obtuse. Face generally pale brown, with the margins, the side lines, and a middle stripe, yellow. Pronotum yellow, the disc frequently occupied by an irregular blackish spot, which is divided in the middle by a pale stripe. Scutellum yellow, sometimes with a black triangle on each side at the base. Elytra whitish-hyaline tinged with yellow, nerves bright yellow, the clavus and the inner areas of the corium frequently more or less completely occupied by black or fuscous stripes; membrane fuscous, nerves pale. Abdomen: above black, yellow at the sides; beneath yellow, black towards the base. Legs yellow, with black lines and points.

Length, 4¾—5⅔ mm.

This interesting addition to our Fauna has been taken sparingly by Mr. Edward Saunders off dwarf sallows at Woking. It is the largest species of the genus that we possess at present, and the male is remarkable for the great development of the characteristic form of the genital plates, of which the narrow apical portion is bent upward at a right angle to the body of the plate, and forms the "*appendice erecta acuminata*" of J. Sahlberg.

Cicadula fasciifrons, Stål. (?).

Thamnotettix fasciifrons, Stål, Stett. Ent. Zeit., 1858, 194, 94.

Cicadula fasciifrons, Fieb., Cicad. d'Eur. (*Cicadula*), 48, 7.

Upper fore-parts sordid greyish-yellow, elytra pale yellow-brown, a pair of short, black, parallel, curved, transverse lines on each side of the forehead. Crown: in the male, two-fifths shorter than the pronotum, one-fifth longer in the middle than at the sides, free sides feebly arcuate, apex widely rounded; in the female, one-fourth shorter than the pronotum, one-third longer in the middle than at the sides, free sides nearly straight, apex widely rounded; basal markings round, interocular line widely interrupted in the middle; frons with black side lines, and sometimes a dark middle stripe. Pronotum with a few black points near the front margin, its disc frequently more or less occupied by a dusky patch, which is divided in the middle by a stripe of the pale ground colour. Base of the scutellum generally with a triangle on each side, and a pair of points in the middle, black. Areas of the elytra frequently more or less filled up by fuscous streaks, nerves pale, except that of the inner margin, which has its basal and apical thirds blackish. Abdomen black, the connexivum beneath, and the hind-margins of the ventral segments narrowly, yellow. Ædeagus as in figures *e* and *f*. Legs greyish-yellow, with black lines and points. Length, 3½—4⅓ mm.

In the field the most striking characteristic of this species is the uniform pale brown appearance of the specimens; and at home, either sex may be easily recognised by the markings on the forehead. It lives on *Juncus articulatus*, on which plant I first took it in quantity at Cley, on the Norfolk coast, in August and September, 1888, and I have since found it in the Norwich district wherever I have had an opportunity of working its food plant. Possessing only a single female in 1887, I regarded it as an intermediate variation between 6-*notata*, Fall., and *frontalis*, Scott; hence the description of the former in my Synopsis was drawn to include all three, and must, therefore, now be abandoned.

CICADULA FIEBERI, *n. sp.*

Cicadula frontalis, Fieb., Cicad. d'Eur. (*Cicadula*), 45, 5, *nec* Scott.

Upper fore-parts bright yellow; prevalent form of marking on the head of the male a pair of round basal spots, and a broad black band across the forehead, interrupted in the middle by a cuneate stripe of the pale ground colour, on this black band the pale ocelli are very conspicuous, and there is generally a short oblique yellow line continued outwardly from each ocellus to the lower angle of the band; sometimes the markings of the crown spread in such a manner that it is wholly, or in greater part, black; this is the state described by Fieber. Markings on the forehead of the female irregularly oblong, slightly arched, sometimes (by reduction) perfectly crescent-shaped. Crown: in the male, one-fourth to one-fifth shorter than the pronotum, one-third longer in the middle than at the sides, free sides feebly arcuate, apex broadly rounded; in the female, one-fifth to one-seventh shorter than the pronotum, one-third longer in the middle than at the sides, free sides straight, apex rounded; frons yellow, with the side lines, and sometimes a middle stripe, blackish; sometimes black, with the side lines and apex yellow. Disc of the pronotum frequently occupied by a dark fuscous patch, which is divided in the middle by a stripe of the pale ground colour, near the front margin a few black points

Markings of the scutellum as in *C. fasciifrons.* Elytra very variable in colour; in many males uniform pale fuscous, with the nerves concolorous, and the costa, and sometimes the inner margin, very narrowly blackish; in many females pale grey, with a greenish tinge, and the nerves paler, or even yellow; in others, some or all the areas are occupied by a broad fuscous stripe, when the pale nerves are very conspicuous, and that of the inner margin is blackish in its basal and apical thirds, with the intervening space whitish. Abdomen and legs coloured, as in the preceding species. Ædeagus as in figures *i* and *k*. Length, 3½—4½ mm.

Weybourne and Cley, Norfolk, by sweeping in marshes near the sea.

This is at present a very little-known species; in 1888, M. Lethierry wrote me that he had only one example in good condition, taken in England, and sent, he thought, by Scott to Fieber as *C. 6-notata*; doubtless this was one of the original examples. It does not, so far as I am aware, occur in inland situations, like its congener, *C. 6-notata.* I have reserved the latter name for the species which is so very abundant with us in grassy places everywhere, and which is most certainly characterized by having the ædeagus as in figures *g* and *h*. In *C. 6-notata* the markings of the head are more prone to vary by way of reduction, than in its allies; the interocular line is not unfrequently absent altogether.

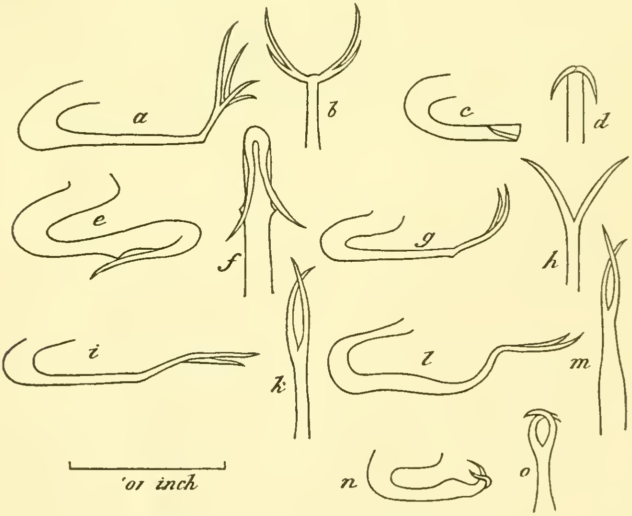
CICADULA CYANÆ, Boh.

Thamnotettix cyanæ, Boh., Sv. Ak. Handl., 1845, 36, 12.
Limotettix cyanæ, J. Sahl., Not. Fenn., xii, 246, 18.
Cicadula cyanæ, Fieb., Cicad. d'Eur. (*Cicadula*), 41, 1.

General colour of the upper-side varying from dark fuscous to black with a bluish tinge; the transverse nerve and portions of those adjoining it frequently forming a whitish H near the base of each elytron. Crown sometimes entirely black, at others exhibiting the normal markings in various degrees of confluence; in the male, three-fifths shorter than the pronotum, the curves of its front and hind margins nearly parallel; in the female, one-half shorter than the pronotum, one-third longer in the middle than at the sides, its free sides nearly straight, apex rounded; frons black, generally with a yellow spot in each apical angle, and sometimes with yellow side lines. Pronotum sometimes entirely black, but generally yellow, with its disc more or less completely occupied by a fuscous or black patch, which is divided by a stripe of the pale ground colour, near the front margin a few black points. Elytra varying in colour from fuscous, with the white H before-mentioned, to uniform pitch-black, with a bluish tinge; nerves concolorous; in many females the fuscous pigment is arranged in streaks, which more or less completely occupy the areas, and leave the nerves pale; in these specimens the middle third of the inner marginal nerve is generally conspicuously whitish. Abdomen: above, black, the hind-margins of the segments very narrowly yellow; in the male, black beneath, with the connexivum narrowly, and the upturned apices of the genital plates, yellow; in the female, black beneath, with some spots on the connexivum, and the pygofer, yellow ; saw-case black. Ædeagus as in figures *l* and *m*. Legs sordid yellow, striped, and spotted with black. Length, 4—4⅔ mm.

Weybourne, Norfolk, by sweeping grasses in a swampy marsh near the sea.

The rarity of this species is probably to be accounted for by the lateness of its appearance ; I found males preponderating in a small series taken on October 18th, 1888, and I took some nearly full-grown nymphs at the same time. This insect has been recorded as occurring on *Nymphæa* and *Potamogeton natans* ; but I think that its occurrence on these plants was due to the habit which it possesses, in common with many other insects living in similar places, of taking to the water when first disturbed, and shortly afterwards returning to the shore ; there were certainly neither water-lilies nor *Potamogeton* in its Norfolk habitat.



EXPLANATION OF FIGURES.

Ædeagus of Cicadula.

a. *C. metria*, side view ; *b.* do., from above.
c. *C. 7-notata*, „ *d.* „ „ beneath.
e. *C. fasciifrons*, „ *f.* „ „ „
g. *C. 6-notata*, „ *h.* „ „ „
i. *C. Fieberi*, „ *k.* „ „ „
l. *C. cyanæ*, „ *m.* „ „ „
n. *C. opacipennis* „ *o.* „ „ „

131, Rupert Street, Norwich :
November, 1890.

SUGGESTIONS TOWARDS A BETTER GROUPING OF CERTAIN FAMILIES OF THE ORDER *DIPTERA*.

BY C. R. OSTEN SACKEN.

Ever since the sub-division of the Order *Diptera* in *Orthorrhapha* and *Cyclorrhapha*, introduced by Brauer, attempts have been made to bring about some mode of arranging the families of *Orthorrhapha* into smaller natural groups. These attempts, first made by Schiner and afterwards developed by Brauer,* cannot be considered as successful. The reason is (as far as the families are concerned which I intend to discuss in this article) that these groupings were principally based upon a character of subordinate value, taken from the wings, and on another character of doubtful importance, borrowed from the larvæ, without sufficient regard for the organization and the affinities of the imagos. I believe that a natural arrangement must be the result of the study of those organs of the imago which are necessary for the functions of external life, principally, therefore, of the organs of orientation connected with the head (eyes and antennæ), and in the second line, of the organs of locomotion (legs and wings).

To begin with the *Nemocera*, as soon as we apply this method to them we discover a mode of grouping more satisfactory, it seems to me, than those hitherto proposed.

The bulk of the true *Nemocera* form a natural aggregation of *five* large families, widely and, as far as known, rather evenly distributed in all parts of the world (*Cecidomyidæ*, *Mycetophilidæ*, *Culicidæ*, *Chironomidæ*, and *Tipulidæ*), and a *sixth*, smaller family (*Psychodidæ*).† The remaining *Nemocera* are represented by *five* small families: the *Bibionidæ*, *Simulidæ*, *Rhyphidæ*, *Blepharoceridæ*, and *Orphnephilidæ*, whose organization is widely different from that of the true *Nemocera*, and whose geographical distribution is peculiar; I form of them an artificial group, the *Nemocera anomala*, which, like the *Limnobina anomala* among the *Tipulidæ*, seems principally to contain archaic forms, remains of bygone entomological horizons.

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* Schiner, in the Verh. Zool. Bot. Ges., 1864, p. 211; Brauer, in his Characteristic der Hauptgruppen, &c. (in the Denkschr. K. Akad. d. Wiss. Vienna, vol. xlii, p. 110); a short synopsis of the same arrangement in *l. c.*, vol. xliv, p. 98; a modified system, *l. c.*, xlvii, p 11; further developments in his Systematisch-Zoologische Studien (Sitzungsber. d. K. Akad. d. Wiss. Vienna, 1885, pp. 237—413), and in the Verh. Zool. Bot. Ges., 1890, pp. 273—275).

† The still problematic *Dixa* will, perhaps, form a seventh family. The discovery of exotic forms may clear up its position. Hitherto, a single species has been described from China (Thomson, Eug., Resa), and three species are mentioned as occurring in New South Wales, but not yet described (Skuse, Trans. Austr. Ass. Adv. of Sc., 1890, p. 350). Thus, about 27 species in all are known to exist (about 15 in Europe, and 8 in North America), save, of course, the possible synonymy.

The true *Nemocera* never have a holoptic head, and hence the differentiation of the sexes in the breadth of the front, and the size and shape of the eyes, if it exists at all, is reduced to a minimum. The eyes round, oval, or lunate, are placed on the sides of the comparatively very small head, and are separated by a more or less broad front; when lunate, their upper or lower ends are often approximate, but there is never that broad contact which constitutes a holoptic head. The development of the antennæ is large, and, in comparison to the small head, sometimes, we may say, excessive (for instance, in some male *Cecidomyiæ*); the contrast in this respect with *Bibio* and *Simulium*, with their large heads and small antennæ, especially in the male sex, is striking. The distinctive character of the antennæ of the *Nemocera* consists in the homology of the majority of the joints of the flagellum; hence their name (from *nema*, thread). Another distinctive character consists in the large development of what we may call ***sensitive hairs***, which adorn the antennæ, and are arranged, especially in the male sex, in the shape of verticils, pencils, and plumes (the *Mycetophilidæ* form in this case an exception). The *legs*, although sometimes very long, are generally weak, and but little fitted for walking; structural peculiarities, useful for classification and description, occur only as exceptions (in *Ceratopogon*, hairy fringes in *Chironomi*, &c.). *Empodia* occur, but in rather weak development; ***pulvilli*** seem to be rare (I perceive something like them in some *Chironomi*).

In general aspect the true *Nemocera* are distinguished by slenderness and lightness; the elongation of the abdomen in comparison to the thorax is especially noticeable (*Psychoda*, which is more thick-set, forms an exception). Their habits are rather crepuscular; they prefer shady places and evening hours. Their larvæ, peripneustic in the *Mycetophilidæ* and *Cecidomyidæ*, meta- or amphipneustic in the other families, correspond to the two natural sub-groups of the section *Nemocera*.

Of course, all these generalities suffer exceptions, but we must bear in mind that the larger the group is which we are considering, the more we must look to the majority of characters only, and the less be embarrassed by exceptions.

In the five small families, for which I propose to adopt the section *Nemocera anomala*, peculiar structures of the head and eyes sometimes (but not always) occur, which, as far as I know, never appear among the genera of the other *Nemocera*. Holoptic eyes occur, not only in the male sex (*Bibio*, *Rhyphus*, *Simulium*), but also in both sexes (*Orphnephila*, and some *Blepharoceridæ*). The eyes are often bisected, the facets upon the upper-side being larger; these two halves of the eye are sometimes bicolorous (*Simulium*), or they are separated by a distinct groove, or even by a transverse unfacetted stripe (*Blepharoceridæ*, male *Bibio*). Empodia and pulvilli, in some genera, have an uncommon development; the legs are sometimes particularly strong and even fit for walking (*Bibio*, *Dilophus*, *Simulium*); the sexes (in these same three genera) are remarkably differentiated in their whole appearance. The number of genera in these families is small (only a single one in the *Simulidæ* and *Orphnephilidæ*, three in the *Rhyphidæ*); the number of species in these genera, in most cases, is likewise small (except in the *Bibionidæ* and *Simulidæ*). A strange monotony prevails, in forms and colours, within the same genus, notwithstanding an extensive, sometimes sporadic, geographical distribution; the metamorphoses are also peculiar. All these peculiarities prove that, in a rational classification, these five small families should be separated from the true *Nemocera*.

Having thus disposed of the old group of *Orthorrhapha Nemocera*, we reach now that of the *Orthorrhapha Brachycera*, and we meet at once with a group of families which have been for a long time converging towards each other during the successive changes in the systematic arrangement, but which found the keystone for their final association only since the application to them of a chætotactic character, the total absence of macrochætæ. This group consists of the families *Stratiomyidæ*, *Tabanidæ*, *Acanthomeridæ*, and *Leptidæ* (plus *Xylophagidæ*). Among the *Orthorrhapha Brachycera* it represents the largest agglomeration of bristleless forms, and deserves for this reason the name *par excellence* of the Section *Eremochæta*. Besides the chætotactic character, these families are strongly bound together by other structural peculiarities, which naturally separate them from the *Nemocera*, as well as from the remainder of the *Brachycera*. 1. The eyes (in the male) are predominantly holoptic; exceptions are either only apparent (as subcontiguous eyes, or, in the *Sargidæ*, approximate eyes in one genus, and absolutely contiguous ones in the very next one) or very rare (*Xylophagus*, with broadly dichoptic eyes in both sexes, some Australian *Chiromyzæ*, *Hermetia*, and some others may be considered as exceptions; but even *Xylophagus* has in *Cœnomyia* a close relative, which is holoptic; and so has

Hermetia in its Australian relative *Massicyta**) ; 2. bisected eyes, with larger facets above than below (in the male) are of very frequent occurrence ; 3. eyes of variegated colour are more common in this Section than in any other of the whole Order of *Diptera*, principally in the *Stratiomyidæ* and *Tabanidæ* ; 4. the antennæ in the group *Eremochæta* are characterized by what I should call a morphological restlessness ; there is no other group of *Diptera* in which the structure of the antennæ varies so much, even in closely related genera. These various forms offer a complete transition from the thread-like antennæ with homologous flagellar joints, characterizing the *Nemocera* (such antennæ occur, for instance, in *Subula varia*, and in *Xylophagus*), to the disc-and-arista type, which becomes so common in the other great division, the *Cyclorrhapha*. This transition is effected by the joints of the proximal portion of the flagellum tending to coalesce and to form a compound joint in various shapes, while the joints of the distal portion gradually pass into the form of a simple bristle. Portions of the antennæ are often beset with more or less long and dense hairs, but the analogue of what I called *sensitive hairs* in the *Nemocera*, forming a verticil, a pencil, or a plume, does not occur here. 5. There are *three well-developed pulvilli*, which is one of the most characteristic features of the *Eremochæta* ; exceptions are rare. The legs are generally smooth, without those bristles and spines that distinguish the *Asilidæ*, and, in a lesser degree, the *Bombylidæ* and *Therevidæ*.

For the final adjustment of the families of this group we must wait for more material. The original arrangement was principally based upon the common European forms ; but this section, perhaps more than any other, is represented by very remarkable and often anomalous forms in the other continents, especially in the tropics ; the anomalous forms that disturbed the old arrangements came especially from Chili (*Cœnura*, *Heterostomus*), and recently from North America (*Agnotomyia*, a Leptid, with only four posterior cells ; *Arthroceras*, also a Leptid, but with the antennæ of *Cœnomyia* ; the singular genus *Glutops*, &c.) ; about Australia and Africa we know almost nothing. Certain it is that the very problematic family of *Xylophagidæ* must be given up, and its contents, temporarily at least, united with the *Leptidæ*. Even the *Acanthomeridæ* may have the same fate ; apart from their enormous size, they are not sufficiently distinguished from the *Leptidæ*, in the new composition of this family.

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* The genera *Psammorycter*, *Lampromyia*, and *Pheneus*, forming the group *Psammorycterina*, Loew, have a narrow front in both sexes, and in this character, as in their whole appearance, seem to mimic the *Asilidæ* ; but here again their close relative, *Triptotricha*, has a holoptic head in the male.

To sum up, the families examined in this paper should, according to my opinion, be grouped as follows :—

I. NEMOCERA.

- Cecidomyidæ.
- Mycetophilidæ.
- Culicidæ.
- Chironomidæ.
- Psychodidæ.
- Tipulidæ.
- (?) Dixidæ.

II. NEMOCERA ANOMALA.

- Bibionidæ.
- Simulidæ.
- Blepharoceridæ.
- Rhyphidæ.
- Orphnephilidæ.

III. EREMOCHÆTA.

- Stratiomyidæ.
- Tabanidæ.
- Acanthomeridæ.
- Leptidæ (plus Xylophagidæ).

I have prepared a more elaborate paper on the subject discussed here, to be published in the "Berliner Entomologische Zeitschrift." But I intend to hold it back for some time, in the hope of improving it through the study of exotic forms in some of the large European collections. This preliminary publication may in the mean time prove useful.

Heidelberg: *January*, 1891.

INSECTS, &c., TAKEN IN THE NESTS OF BRITISH *VESPIDÆ*.

BY R. NEWSTEAD, F.E.S.

CURATOR, GROSVENOR MUSEUM, CHESTER.

Having collected all the British *Vespidæ* (except *V. crabro*) in the Counties of Cheshire and Denbighshire for our Museum, I deemed it necessary to work up their parasites, in order to make our collection more educational. In 1889 wasps were exceptionally abundant throughout our district, so I thought it a fitting opportunity to collect their nests for the above purpose.

I think the best plan for taking their nests is to place a round stick of cyanide of potassium in the burrow leading to the nest in the evening, and to carefully stop the entrance afterwards with a pebble. Before 7 a.m. the following morning the nest should be taken, if not, the pebble must be removed to allow the benighted wasps to enter, of which there are always a goodly number. If the latter plan be adopted, the nest must be left until the evening, when it can be taken without the least danger of being stung.

All nests taken should be examined at once, and afterwards placed in large flowerpots with a small quantity of earth in them, covered with calico, and placed in a warm outhouse. These, of course, must be examined from time to time for anything that may be hatched from them. The cyanide kills all imagines, no matter of what Order, but it seems not to effect the larvæ.

Vespa germanica and *V. vulgaris* were fairly abundant this year (1890), but not so numerous as last year; the majority of their nests, however, were exceptionally large. One nest of *V. germanica* measured 15½ inches in diameter, and weighed 11½ lbs.

The following is a list of the species taken: —

†CRUSTACEA.

Porcellio scaber, Latr.—turns up in almost every nest.

ACARIDA.

Uropoda elongata, Haliday.—new to us; seven attached to *Homalomyia canicularis* bred from a nest of *V. germanica*, Ince, Cheshire, October, 1889. Nymphal forms only.

Glyciphagus spinipes. — swarmed in nest of *V. germanica*, October, 1890, Chester "Cop."

Some nests of *V. germanica* simply swarmed with a species of *Tyroglyphus*, August to October, 1889, Cheshire and Colwyn Bay.

COLEOPTERA.

†*Leistus rufescens*, F.—one specimen from nest of *V. vulgaris*, Nant-y-glyn, Colwyn Bay, August, 1889.

†*Pterostichus vulgaris*, L.—one specimen in nest of *V. vulgaris*, Colwyn Bay, August, 1889; one in nest of *V. germanica*, Chester "Cop," August, 1890.

†*Bradycellus verbasci*, Duft.—three specimens in a single nest of *V. vulgaris*, Nant-y-glyn, Colwyn Bay, August, 1889.

†*Choleva tristis*, Panz.—two specimens in nest of *V. germanica*, Ince, Cheshire, October 10th, 1890; nest nearly deserted.

†*Homalota succicola*, Thoms.—three specimens in nest of *V. vulgaris*, Nant-y-glyn, Colwyn Bay, August, 1889.

Quedius puncticollis, Thoms.—three specimens in nest of *V. germanica*, October 10th, 1889; larvæ abundant in same nest. A few of these produced imagines the following April.

Epuræa obsoleta, F.—three specimens in nest of *V. germanica*, Colwyn Bay, August, 1890.

Cryptophagus pubescens, Sturm.—abundant in many nests of *V. germanica* and *vulgaris*, Colwyn Bay, and Ince, Cheshire, August, 1889, to April, 1890. *C. setulosus*, Sturm.—common in nests of *V. vulgaris*, Colwyn Bay, August, 1889; sparingly at Ince, Cheshire.

Metœcus paradoxus, L. — several in a single nest of *V. vulgaris*, Manley, Cheshire, August, 1889; these were taken by Mr. A. J. Nixon.

**Thyamis lurida*, Scop.—one in nest of *V. germanica*, Colwyn Bay, August, 1889.

HYMENOPTERA.

Aspilota concinna, Hal.—in a single nest of *V. vulgaris*, Nant-y-glyn, Colwyn Bay, October, 1889.

Proctotrupes ?.—several specimens that may belong to this or an allied genus. They are very much at the service of any specialist. One in nest of *V. vulgaris*, October, 1889, and several from this and *V. germanica*, April, 1890, Colwyn Bay and Cheshire.

DIPTERA.

Cyrtoneura stabulans, Fall.—abundant in nests of *V. germanica*, August to April, Colwyn Bay, and Ince, Cheshire, 1889—90.

Homalomyia canicularis, L.—abundant in nests of *V. germanica*, very sparingly in nests of *V. vulgaris*, August to April, Colwyn Bay, and Ince, Cheshire, 1889—90. *H. vesparea*, Meade, *n. sp.*—I found the larvæ of this in the same nest as I did those of *A. inanis*. Not knowing at the time that it was new to science, I made no description of it. These only produced two perfect insects on the 26th of July, 1890. Mr. Meade says, "The species occupies an intermediate position between *Hom. scalaris*, F., and *Hom. coracina*, Lw." One specimen is in the collection here, the other in Mr. Meade's.

Phora rufipes, Meigen.—occurred in every nest examined, August and September, Colwyn Bay and Cheshire.

Acanthiptera inanis, Fall.—larvæ swarmed in single nest of *V. germanica*, October 10th, 1889; imagines hatched July, 1890; Ince, Cheshire.

Volucella bombylans, L., var. *plumosa*.—larvæ most abundant in nests of *V. germanica*, Colwyn Bay and Cheshire, August to October.

I also found several specimens of *Lepidoptera* too worn for identification. At least three species of *Diptera* deposit their ova on the outer covering of the nest. I have found them on very many nests, but I am unable to say which of the species deposit them there.

Does it not appear very strange that such soft bodied insects as the *Diptera* dare venture into a wasp's nest without being protectively coloured? One can easily see that any insect conferring a benefit upon the wasps, by ridding their nests of dead larvæ, would be welcomed into their strongholds as friends and helpers. But when we find at least four species of the *Diptera* parasitic on the *Vespidæ* apparently without any protection whatever, one feels much puzzled, especially when we know for a fact that the *Vespidæ* feed upon the *Diptera*, and upon species too that are allied to *Anthomyia*. All the *Diptera* are diurnal, and therefore must of necessity enter the nests in the daytime in order to deposit their ova.

Except a few *Coccinella 22-punctata* found hibernating in an old nest of *V. britannica*, I have not taken any parasites from the nests of this species. I have not taken nests of *V. sylvestris* or *V. rufa*.

My best thanks are due to the following for their valuable help in determining the species:—Messrs. J. B. Bridgman, E. Bostock, R. H. Meade, Edwd. Saunders, and Rev. W. W. Fowler.

Grosvenor Museum, Chester:
December 5th, 1890.

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† I think are mere intruders in search of food. Certainly not parasites.
* Accidental visitor.
The other species seem to be true inhabitants, if not parasites.

ADDITIONS TO THE LIST OF BRITISH *ANTHOMYIIDÆ*.

BY R. H. MEADE.

MYDÆA AFFINIS, *sp. n.*

♂. *Livida subnitida, cano-tomentosa; oculi contigui; thorax antice distincte, postice obscure, vittatus; abdomen linea dorsali tenui, tessellisque nigris ornatum; femora omnia* (*cum tibiis*) *flava.* *Long.*, 8—9 *mm.*

This species bears such a close resemblance to *M. pagana*, Mgn., that I formerly considered it to be only a variety of that fly; but, after the careful examination of a specimen which I captured in June last, I have no doubt about its being distinct.

It is of a bluish-black colour, having whitish-grey tomentum on the thorax and abdomen. The eyes are coherent. The thorax is distinctly marked by four black stripes on its front half, but the lines become nearly obsolete behind the transverse suture. The abdomen is marked by a narrow longitudinal stripe in the middle of the upper segments, and also distinctly tessellated by irregular black spots or patches. The legs are entirely reddish-yellow, with the exception of the tarsi, which are black.

M. pagana varies in colour; the more common variety is covered with yellowish-grey tomentum, but in many examples this is of a whitish or bluish-grey colour. *M. affinis* resembles the latter variety in tint, but differs from both kinds in the following points: the eyes are coherent instead of being subcontiguous; the hinder part of the thorax is less distinctly striped; the dark abdominal patches or tessellations are much more marked; and the fore femora are entirely yellow, not blackened at the base as in *M. pagana*.

I captured two males of this species near Lake Windermere several years ago, and found another in June, 1890, at Grange-over-Sands, in Lancashire; also in the Lake District. I do not know the female.

HOMALOMYIA VESPARIA, *sp. n.*

♂. *Nigra subnitida thorace substriata, abdomine elongato-glauco, maculis trigonis ampliis signato; oculi arcté contigui; femora intermedia sub-buccata, subtus, barbata, basi nuda; tibiæ intermediæ tuberculo elongato plano, breviter ciliato, instructæ; tibiæ posticæ villosæ.* *Long.*, 7 *mm.*

This species closely resembles *H. scalaris*, F., in size, shape, colour, &c.; it is also nearly allied to *H. coracina*, Lw. (*H. spissata*, mihi*), but differs from them both in several well marked distinctive characters, which I will briefly point out.

The eyes are quite contiguous, while they are somewhat separated in *H. scalaris*, and also to a less degree in *H. coracina*. The antennæ and other parts of the head resemble those of *H. scalaris*. The thorax is black, shining, and indistinctly striped, as in both the other allied species. The abdomen resembles that of *H. scalaris*, being elliptical, rather more elongate than that of *H. coracina*, and marked as in *H. scalaris*, with much wider triangular dorsal marks than in *H. coracina*. The wings have the third and fourth longitudinal veins slightly approximated at their extremities, as in *H. scalaris*; they are almost parallel in *H. coracina*. The internal transverse veins are situated at some distance before the termination of the auxillary vein, with the point of which they are placed in almost a straight line in both *H. scalaris* and *H. coracina*.

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* See the description of this species in Ent. Mo. Mag., vol. xviii, p. 203.

The legs are black. The front pair present no peculiar characters, but the intermediate ones have the femora somewhat swollen or dilated a little beyond the centre, their basal third is bare, but the middle and anterior portions are spinose beneath; the thickest and strongest bristles forming a sort of beard under the swollen portion of the joint. In *H. scalaris* the middle femora are of the ordinary shape (slightly thickened in the centre), and are bristled along their whole under-surface, the spines being concentrated into a tuft of very strong blunt bristles towards the middle. In *H. coracina* the bristles on the under-sides of the middle femora are less tufted than in the other two species, and extend from the base along the posterior three-fourths, leaving the distal or front part bare; there is also no abnormal thickening of the limb.

The middle tibiæ in *H. vesparia* have an elongated projection or tubercle on their inner sides, which occupies about two-fifths of the distal end; it is even in shape, and ciliated over the whole inner surface with short straight hairs, somewhat in the same manner as the corresponding tubercle in *H. armata*, Mgn., in which it is, however, larger, irregular in shape, and armed with longer hairs.

In *H. scalaris* the tibial tubercle is in the shape of a short thick lump at the inner end of the joint, and quite bare; in *H. coracina* it is somewhat similar in shape to that in *H. vesparia*, but more irregular upon the surface, and destitute of hairs, with the exception of a few soft ones on its lower part. The hind tibia are ciliated upon both sides much as in *H. coracina*; they are almost bare in *H. scalaris*.

Mr. R. Newstead, Curator of the Grosvenor Museum, Chester, kindly sent me a male of this species, which he had bred from larvæ which he had found in the nest of VESPA *germanica*, together with those of ACANTHOPTERA *inanis*, Fln., and HOMALOMYIA *canicularis*, L. The larvæ of the last named common fly seem to be common in wasp nests, and Zetterstedt mentions* that they have also been found in those of *Bombus terrestris*.

The interesting question arises—what is the food of these larvæ in these nests? Those of *H. canicularis* and also of *H. scalaris* are well known to feed commonly upon ordure and various rotten vegetable matters, as decayed cabbage stalks. What do they find to eat in wasps' nests? They cannot be parasites upon the wasp larvæ. Do they eat the excrement emitted by these?

LIMNOPHORA LITOREA, Fln.

I captured two males of this well-marked species at Grange-over-Sands, Lancashire, in June, 1890. It has not yet, I think, been recorded as British; it is characterized by having the eyes in the male separated by a broad black line; by the antennæ being rather long, and having the arista very slightly pubescent; by the thorax being grey with whitish shoulders and sides, and marked on the dorsum with three somewhat confluent and indistinct stripes; the lateral ones broad and irregular (maculiform) in shape, and the middle one apparently made up of several narrow lines; by the scutellum being grey, with a black mark on each side; by the abdomen being of a clear grey colour, and marked with four moderate sized triangular spots. It is about 6 mm. in length.

Bradford, Yorkshire:
December 13th, 1890.

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* Dipt. Scand., t. xiv, p. 6251.

ON A BRAZILIAN SPECIES OF *ALEURODES* FOUND IN ENGLAND.

BY J. W. DOUGLAS, F.E.S.

ALEURODES FILICIUM.

Aleurodes filicium, Goldi, Mittheil. schweiz. entom. Gesells., vii, 247 (1886).

Pupa. Subdiaphanous, pale greenish, oval, the sides anteriorly very slightly sinuous; within the margin all round a parallel line, the intervening space crossed by equidistant, straight lines; a second parallel line within the first, often indistinct, the space thus formed also crossed by lines closer and shorter than in the first zone; the two series forming a double row of subquadrangular meshes, which Goldi terms "doppeltem Fransensaum;" from this very faint, close lines proceed convergently to the disc, where the body of the insect beneath shows through; the margin, at times, with very small, close, obtuse dentation, and exterior to all the usual delicate, white, waxy, band-like secretion is attached to the margin, and being also adherent to the frond it is more or less broken off and left behind if the insect be raised. On the under-side are five pairs of strong, setaceous hairs, viz., one pair on the head, two on the sternum, and two on the abdomen posteriorly, all of them very long and mostly projecting beyond the margin. Eyes red. Length, ½ mm.

Imago ♀. White; abdomen more or less pale yellow, wings spotless; antennæ densely farinose, of seven joints; the 1st very small; 2nd much longer, stout, subclavate; 3rd longest of all, slender, joined to the 2nd by a short petiole; 4th to 7th shorter, subequal, filiform; eyes large, black, with minute white dots (facets) in rows, oval, but appearing long-reniform ("bean-shaped," Goldi), by reason of a granulated projection from the middle of the inner side.

Expanse of wings, 2·5 mm.

The foregoing agrees with Dr. Goldi's description (*l. c.*) except as regards the pupa in two small points, due doubtless to the stage of development of the insect when under notice; thus, the margin is less sinuate, and the second intramarginal line is not so continuous as in his figure. In the imago the antennæ are stated to have six joints, but there are really seven, which is the normal number in the genus, as Signoret has shown (Ann. Soc. Ent. France, viii, 369, 1868); in this case one of the articulations, which, on account of the white powder, and the transverse striæ when the antennæ are mounted in a transparent medium, are difficult to distinguish, appears to have been overlooked.

Of this distinct species, doubtless imported on ferns from a tropical country, many examples of pupæ and ♀ imago were obtained by Mr. S. J. McIntire, during September and October, in the tropical fern-house in the Royal Gardens, Kew, on the under-side of the fronds of ferns, chiefly *Oleandra articulata* and *Pteris quadriolata*. Dr. Goldi found the species on the under-side of the fronds of *Asplenium cuneatum* and other Brazilian ferns in the Botanic Garden at Rio de Janeiro, but of the perfect form only females, the reason in both cases being, probably, that the males fly off with greater agility, as is the habit in other species.

153, Lewisham Road, S.E.:
October, 1890.

LIST OF *NEUROPTERA* OBSERVED AT RANNOCH IN JUNE, 1889.

BY J. J. F. X. KING, F.E.S., AND K. J. MORTON.

Rannoch has been visited by hosts of entomologists, but as few of them have paid attention to the *Neuroptera*, we have no hesitation in giving the following list of the results of a visit during the last summer, when we made that Order our special object of search.

While, as we have indicated, few recent visitors seem to have collected *Neuroptera*, the productions of the district in that Order are not altogether unknown, as Mr. McLachlan was there in 1865, and obtained many interesting species. Amongst other things certain rare *Odonata* of alpine and boreal distribution were found to have their home there, but even these insects, conspicuous as they are in point of size and beauty, seem not to have caught the popular eye, and it was beginning to be a question whether they still survived in the old locality. We are glad to have been able to settle that question in a satisfactory way, and we also made large collections in the Order generally.

The time of our stay was limited to a week exactly (15th to 22nd June—too early for many species); our head quarters were near Camachgouran, and our operations extended from the shores of the Loch to Cross Craig, Camcreagh, near Loch Lydoch, and Loch Ericht, the last named a magnificent sheet of water, but difficult to work on account of the dearth of shelter.

The weather was of the most brilliant kind possible, the heat was intense, and the biting flies countless in number and awful in virulence. The fine weather conditions made dragon-flies almost past catching, and we had sometimes to endure the tantalizing sight of unknown *Æschnæ* and an occasional *Somatochlora* about the tree tops hopelessly out of reach. Some good dragon-flies were taken about 7 o'clock in the morning in the Woods, flying about swampy places and along the roads.

The species taken are as follow:—

TRICHOPTERA.

PHRYGANEIDÆ.

Phryganea striata, L.—A pair, evidently just developed, at a weedy lake-like expansion of River Gaur.

LIMNOPHILIDÆ.

Limnophilus centralis, Curt.—Common, by beating firs. *L. auricula*, Curt.—Two ♀ from firs at foot of Cross Craig. *L. griseus*, L.—Rather common in firs near Cross Craig. *L. luridus*, Curt., and *L. sparsus*, Curt.—Both these species occurred with the last named.

Asynarchus cœnosus, Curt.—One specimen on the Moor behind Camachgouran.

Stenophylax infumatus, McL.—The day we arrived we were fortunate enough to fall upon what was probably the original locality whence Mr. McLachlan procured his typical specimens—a deep-cut moor stream overhung by heather and bog myrtle. There the insects were rather common, mostly ♂, but only to be found after diligent search in a manner which experience alone can teach, and which is hard work. *S. stellatus*, Curt.—Very common at Loch Rannoch; occurred also at Loch Ericht. *S. latipennis*, Curt.—A single ♂ at a moor stream at foot of Cross Craig.

Micropterna sequax, McL.—A ♂ bred from a case found in a dribbling stream running down Camereagh. The stones lying around were dotted with nymph skins presumably of this species. *M. lateralis*, Steph.—Very common.

Ecclisopteryx guttulata, Pict.—Dall Burn and Loch Ericht.

Apatania Wallengreni, McL.—Abundant all along Loch Rannoch side, but we must surely have been too late for the ♂, to which sex hardly 10 per cent. of the specimens taken belonged.

SERICOSTOMATIDÆ.

Sericostoma personatum, Spence.—Taken singly at Loch Ericht and elsewhere.

Brachycentrus subnubilus, Curt.—Two specimens from River Gaur (this species would be over).

Lepidostoma hirtum, F.—Not uncommon.

Lasciocephala basalis, Kol.—A single ♂ at Loch Ericht.

LEPTOCERIDÆ.

Leptocerus nigronervosus, Retz.—In profusion along a calm reach of River Gaur. The specimens taken here were paler in colour and larger than a few from the Loch side, which were small and dark.

Triænodes bicolor, Curt.—Occurred near the locality mentioned for *P. striata*.

HYDROPSYCHIDÆ.

Hydropsyche pellucidula, Curt.—Two ♀ on River Gaur; the species probably over. *H. guttata*, Pict.—Only one ♂ from near the head of Loch Rannoch. *H. instabilis*, Curt.—A ♂ taken near the Loch.

Philopotamus montanus, Donovan.—Dall Burn and elsewhere, sparingly.

Plectrocnemia conspersa, Curt., *P. geniculata*, McLach.; *Polycentropus flavomaculatus*, Pict., *P. multiguttatus*, Curt.—All taken at moor streams by beating the overhanging heather; and all common, save *P. geniculata*, of which only a few specimens were taken.

Cyrnus trimaculatus, Curt. — Only one specimen preserved, but doubtless common.

RHYACOPHILIDÆ.

Rhyacophila dorsalis, Curt.—Common.

Agapetus fuscipes, Curt.—Only one or two taken.

Glossosoma vernale, Pict.—Occurred singly.

HYDROPTILIDÆ.

Hydroptila femoralis, Eaton.—Not uncommon at Loch Ericht and Loch Rannoch.

Oxyethira costalis, Curt.—Common everywhere.

NEUROPTERA-PLANIPENNIA.

SIALIDÆ.

Sialis lutaria, Lin., and *S. fuliginosa*, Pict.—Occurred on the Dall Burn.

HEMEROBIIDÆ.

Hemerobius inconspicuus, McL., *H. nitidulus*, Fab., *H. orotypus*, Wall., *H. limbatus*, Wesm.—All very common in the fir trees in the Black Wood. *H. nervosus*, Fab.—A few from fir trees near the base of Cross Craig.

PSEUDO-NEUROPTERA.

PSOCIDÆ.

Psocus fasciatus, Fab., and *Elipsocus unipunctatus*, Müll.—Not uncommon in Black Wood, by beating fir trees.

PERLIDÆ.

Isogenus nubecula, Newm.—Very short winged forms of this were taken by sweeping the lower branches of alders on the shores of the Loch.

Chloroperla grammatica, Poda.—Very common.

Isopteryx tripunctata, Scop.—Very common.

Capnia nigra, Pict.—One specimen (an early species; quite a number of it were taken when I walked across the Moor of Rannoch on Easter Sunday: J. J. F. X. King).

Tæniopteryx trifasciata, Pict.—Was especially abundant on the higher parts of the Dall Burn.

Leuctra fusciventris, Steph.—Common.

Nemoura variegata, Oliv.—Very abundant, as is usual with this. *N. Meyeri*, Pict.—Sparingly near Lochs Rannoch and Ericht. *N. lateralis*, Pict.—Common at both Lochs. *N. cinerea*, Oliv.—A few specimens taken. *N. humeralis*, Pict.—Very common.

A large *Perla* was found near Kinloch, but the bottle containing it was unfortunately lost.

EPHEMERIDÆ.

Ephemera danica, Müll.—Common along the side of the Loch in the evening.

Leptophlebia marginata, Lin.—Sparingly along the Loch from Kinloch to its head. *L. cincta*, Retz.—Common.

Cloëon simile, Eaton.—Only one specimen of this usually common species.

Centroptilum luteolum, Müll.—Common.

Baëtis rhodani, Pict.—Near Camachgouran and at Loch Ericht. *B. pumilus*, Burm.—Not uncommon.

Siphlurus lacustris, Eaton.—Three specimens from Loch Rannoch and Loch Ericht.

Rhithrogena semicolorata, Curt.—Rather common near both Lochs.

Ecdyurus venosus, Fab., and *E. lateralis*, Curt.—Common near both Lochs.

ODONATA.

Leucorrhinia dubia, V. de L.—Three specimens at a pool on the Moor towards Cross Craig.

Libellula quadrimaculata, L.—Rather common on the Moors.

Somatochlora arctica, Zett.—One specimen on the Moor behind the Black Wood. The species was also observed flying about the trees in the higher part of the Wood itself.

Cordulegaster annulatus, Latr.—Common.

Æschna borealis, Zett.—Five specimens of this rare *Æschna* were caught, mostly about the Black Wood. *Æ. juncea*, Linn.—One female taken.

Enallagma cyathigerum, Charp.—A few specimens preserved; probably common.

Pyrrhosoma minium, Harris.—Very common.

Glasgow: *September*, 1890.

Eupithecia togata in the New Forest.—It is satisfactory to be able to record the capture of this handsome "Pug" near Brockenhurst during the past season, for, although it might well be expected to occur in the New Forest, I am not aware that it has previously been reported from that "happy hunting-ground." On July 19th, Mr. C. Gulliver gave me a living example of a "Pug"—unknown to him,—which he had just taken among some fir-trees, spruce being, of course, among the number. It was worn absolutely to a shadow, but proved to be an undoubted specimen of *E. togata*; and, although worthless for the cabinet, it is none the less interesting on that account.—Eustace R. Bankes, The Rectory, Corfe Castle: *Dec. 5th*, 1890.

Butalis laminella in the Isle of Purbeck.—Ever since the discovery of this species in Arundel Park by Mr. W. H. B. Fletcher, in July, 1886 (Ent. Mo. Mag., xxv, 15, 16), I have been extremely anxious to turn it up in this district, thinking it more than likely that two or three specimens, which had been reported as *B. fusco-ænea*, were in reality its smaller ally. Fortunately, my hopes have *at last* been realized, for, in the middle of June, I met with "the genuine article" in one restricted spot on our coast among some scattered plants of *Helianthemum vulgare*, and by spending the best part of some six days or so climbing about a most uncomfortably steep and rough part of the cliff, I succeeded in taking just enough presentable specimens to fill up my series. These specimens were certainly very hardly earned, for, unless the sun was shining brightly (which it had a most irritating knack of *not* doing!), it was quite useless to try for the insect at all; and in any case, owing to the nature of the cliff, sweeping, though extremely difficult to manage, was the only plan of attack possible, but unfortunately its effect is too plainly visible in the rubbed and damaged condition of some of the specimens.—Id.

Tinagma betulæ in East Dorset.—While the Rev. O. P. Cambridge, Mr. N. M. Richardson, and I were searching for mines of *Lith. anderidæ* at Bloxworth, in October last, we found very evident traces of where the larvæ of this new *Tinagma*, lately discovered by Dr. Wood, of Tarrington, had been at work earlier in the year, a good many of the birch leaves attracting attention by the neat oval holes where the full-fed larvæ had cut out their cases. Mr. Cambridge also had in his cabinet, under the name of *T. resplendellum*, a particularly fine specimen of *T. betulæ*, which he had taken at Bloxworth, in July, 1887. Dr. Wood has very kindly examined both the mined leaves and the moth, and his report upon them is quite satisfactory. How easy it oftentimes is to meet with a recently-discovered or little-known species when some one with keener perception or greater perseverance has already given one the necessary "lead over" with regard to its habits!—Id.

Retarded emergence and a second brood of Gelechia ocellatella.—On May 7th of the present year, I collected at Portland some larvæ of *Gelechia ocellatella*, but only kept for myself a few which were left over, and which I naturally expected would produce the perfect insects, as on previous occasions, during the latter half of June or early days of July. Eight moths altogether were bred, the dates of their appearance being: July 2nd, 13th, 17th; August 13th, 17th, 27th, 28th; September 7th. In my previous experience of this species, extending over several years, June 21st is the latest date on which the first moth has appeared, and none have ever emerged after the middle of July. The retarded emergence shown this year is the more remarkable from the fact that the larvæ, all collected on the same day, had of necessity to feed up quickly or not at all, as the only victuals available for them were the leaves and spun shoots of *Beta maritima*, in which they were when gathered.

In strange contrast to my own experience was that of my friend Colonel Partridge with *G. ocellatella* in the past season, as he collected feeding larvæ on the same ground in Portland in the latter part of July, and these produced the moths in September! It is clear, therefore, that, in some cases at any rate, this species is double-brooded; a most interesting fact of which I was previously in ignorance.—Id.

On Ephestia Roxburghii, Gregson.—In a recent paper in the "Entomologist," Mr. South includes, in a notice of the "Deltoides, Pyralites, and Crambi," introduced into the British list within the last thirty years (or more) the name of *Ephestia Roxburghii*. It so happens that within the past year I have had opportunities of examining several of the (very few) known specimens of this so-called species: first the original type in Mr. Gregson's collection, now in the possession of Mr. Sydney Webb, at Dover, and more recently those in the collection of Mr. S. J. Capper and the late Mr. N. Cooke, at Liverpool.

All these specimens are, I am firmly persuaded, merely melanic forms of *E. elutella*, Hüb., and in this view I am supported by the excellent judgment and experience of Mr. Webb. The original description is somewhat obscure, but one made by M. Ragonot (Ent. Mo. Mag., vol. xxii, p. 25) is, when the dark colour is omitted, actually an accurate description of *elutella*:—"Fore-wings broad, costa *rounded*, colour pale brownish-grey, first line oblique, greyish, hardly paler than the ground colour, second line slender, pale grey, parallel to the hind-margin, slightly sinuous, followed on the costa by a dark streak. Cilia pale brownish-grey, preceded by an indistinct dark line." The addition of, "median space entirely suffused with blackish-brown, in which the discal spots are hardly perceptible," scarcely indicates sufficient character for a distinct species. M. Ragonot seems to have been somewhat misled by a superficial resemblance in the insect to *Cryptoblabes bistriga*, though his careful scientific examination of the specimen brought it back to its real place, or very nearly. If the intermediate shades of variation had been before him he would doubtless have recognised it as *elutella*.

It is a curious circumstance with this *elutella*, that besides its wide range of colour—whitish-grey, pale grey, pale yellowish, half grey and half ochreous, and various shades of slate colour and dark grey—it is also most unstable in the position and direction of its transverse lines, and in this form called *Roxburghii* the aberration is rather decided, the first line being quite oblique and rather straight; but the comparative straightness arises from the absence of the usual dark indentations which have become invisible, and in this respect, and in the position of the line, the species shows a range of variation extending to that in which the first line is perpendicular. The form of the costal margin, in which *elutella* seems to differ from all its allies, is, however, most constant.—Chas. G. Barrett, Linden Grove, Nunhead, S.E.: *January*, 1891.

Change of name of a palæarctic Pyrale.—Having recently obtained from Natal Cramer's *venustalis* (of which *testula*, Hb., and *divulsalis*, Z., appear to be merely synonyms), I find it to belong certainly to the genus *Titanio*. Hence *Titanio* (*Noctuomorpha*) *venustalis*, Ld., a very different species of the same genus from Armenia, must receive a fresh name, and I propose for it that of *echinæa*.—E. Meyrick, Ramsbury, Hungerford: *January* 13*th*, 1891.

Captures of Trifurcula pallidella and Anybia Langiella.—On September 2nd, 1888, I captured a specimen of *Trifurcula pallidella* at Glanville's Wootton; there is plenty of *Genista tinctoria* in this parish. Of *Anybia Langiella* I met with a specimen at Glanville's Wootton on July 15th, 1890, and on October 20th I took another at Boscastle in Cornwall.—C. W. Dale, Glanville's Wootton, Sherborne, Dorsetshire: *January* 9*th*, 1891.

Note on Sphaleroptera ictericana.—On July 15th, 1890, I took five or six empty cases of *Taleporia pseudo-bombycella* on some old fencing at Aldeburgh, Suffolk, and was much surprised about a fortnight later to see a specimen of *S. ictericana* emerge from one of them. The larva must have wriggled itself into the case, and so saved itself the labour of constructing a cocoon.—C. T. Cruttwell, Dinton, Norfolk: *January*, 1891.

Note on Tortrix costana, var. latiorana.—On July 14th, 1890, I took two specimens of this variety on the salt marshes near Aldeburgh, Suffolk, flying in company with *T. viburnana*, which was abundant.—Id.

"*A query as to hibernation.*"—In reply to Dr. Chapman (Ent. Mo. Mag., xxvii, p. 22), I can at any rate vouch for one hibernating Lepidopteron in which the pairing takes place in the autumn, viz., *Dasypolia Templi*. When eggs of this species are wanted, the ♀ are almost always collected in October and November, and kept alive singly in chip boxes until spring, when they freely deposit their eggs. I have kept the ♀ alive through the winter myself, and sent numbers away to friends in the autumn, and except in cases where the moths have died before spring through unsuitable treatment during the winter, they have always, so far as my friends have told me, deposited fertile eggs in the spring. This fact is so well and has been so long known, indeed (see the late William Buckler's description of the larva, Ent. Mo. Mag., iv, p. 251), that Dr. Chapman must have overlooked it when writing his note. I had a very strong impression too that the same thing occurred with several of the species mentioned by Dr. Chapman, but this is simply an inference from the fact that most of the spring species taken (I am alluding to the *Noctuæ* more particularly) appear to be ♀, and however early they may be taken, the eggs obtained are always counted on as fertile. But as Dr. Chapman "knows fertilization takes place in the spring," I cannot gainsay it, as no doubt he has *seen* the various species paired after hibernation. But if not in the case of every species he mentions, I would point out that the fact of a few ♂ being found in spring does not by any means prove his theory. The ♂ of *D. templi* hibernate under stones along with the ♀, and are found with them well into the winter; and I have no doubt that in a mild winter some of them survive and fly again in spring. I believe, indeed, but am not absolutely certain, that I once saw a ♂ at a gas lamp in spring. But except when searched for in old stone quarries after hibernation has begun, when in some years it occurs plentifully, the species is only occasionally seen at large in this district.—Geo. T. Porritt, Huddersfield: *January 8th*, 1891.

Fleas in martins' nests.—I very recently obtained two nests of the house-martin (*Chelidon urbica*), and in picking the clay asunder discovered a number of fleas (*Pulex gallinæ*), each in a separate crack, that is, I did not observe two together. As I found them I placed them in a test tube with some crimped paper to sport on. Into this tube I transferred 178 fleas, and put them in a drawer of my writing desk. The next day being fine, I took them out and placed them in the sun. After a short exposure, the warmth very soon aroused them out of their hibernating inclination; I presume they thought summer had arrived, for the males very soon began to select their partners; with some of them pairing only lasted a few seconds, which I think probably abnormal, others remained paired longer. I was desirous of obtaining some in this position, but unfortunately had to sacrifice all. I killed them by throwing them into boiling water, and by this means secured seven pairs *in cop.* I therefore presume that the males and females hibernate, and that the latter are not fertilized until the spring.

Having examined the contents of the nests of the house-martin, I thought I would see how matters stood with the sand-martin (*Cotile riparia*); in turning over the contents of these nests, about ten days after that of the house-martin, I was surprised to see the enormous quantity of fleas in cocoons; I have no hesitation in saying that the two nests contained upwards of 2000, and I bottled more than 200, but I could not keep pace with their appearance, and consequently had to carry them out of doors into the cold air to prevent them leaping about so freely as they did when indoors in a warm room; but having been aroused from their winter sleep they still continued too lively, and to prevent their further acquaintance with myself, and fearing they would have a desire to introduce themselves unsolicited to the members of my family, I thought it advisable to plunge them into boiling water.

In the nest of the house-martin among the lining, which consisted of roots of grass, feathers, &c., I observed several larvæ of *Lepidoptera*, apparently those of some *Tinea*; these appeared to have first confined their attacks to the pupa-cases of the fleas, for of these I could not discover one; this may have driven the fleas to seek shelter in the mud cracks of the nest; but in the nests of the sand-martin the only scavenger I saw was a beetle (a single specimen) and two larvæ, which I suppose were those of the same species; a few *Acari* were in this nest and also two or three in the former, with a few larvæ of the fleas still feeding. The fleas from the sand-martin are very much darker than those from the house-martin, and they may be a distinct species.

I sent a few of each to Mr. Walker of Liverpool, and in dissecting one he found a small Acarus within the abdomen of one of the fleas of the sand-martin. This is not the first time that *Acari* have been found in a flea; in a note in "Science Gossip" for 1871, p. 88, the following sentence appears:—"After soaking (the mole flea) in *liquor potassæ,* and squeezing it between two glasses prior to mounting, I was surprised to see large numbers of mites expelled from the abdomen, and after I mounted it in balsam, I was pleased to find that seven mites still remained in the abdomen."

I did not intend to publish these notes until the end of the year, in order to make them more complete, but desired to add to Dr. Chapman's paper that fleas pair after hibernation.

I have several notes of instances as to *Pulex irritans* being found passing the winter in their cocoons, spun up in bed furniture.—G. C. Bignell, Stonehouse: *January* 7*th*, 1891.

Review.

"The Honey Bee: its Natural History, Anatomy, and Physiology;" by T. W. Cowan, F.L.S., F.G.S., &c. Houlston & Son, London. 1890.

In this little book is put together in as popular a form as such subjects will allow, an account of the Hive Bee, treating it both structurally and physiologically. Mr. Cowan seems to have quoted carefully from the various authorities, giving the pagination for the quotations, which will greatly enhance the book's value. Where structure is so fully treated of, we are surprised to find no mention of the transference of the first abdominal segment in the larva to the thoracic group of segments in the imago, creating the propodeum of Newman, and the figures on page 70 puzzle us; still, we think we can safely recommend the little book to those who wish to know something about the Honey Bee.

Societies.

Birmingham Entomological Society: *December* 15*th*, 1890.—Mr. W. G. Blatch, F.E.S., President, in the Chair.

Mr. H. J. Sands, Harborne, was elected a Member of the Society.

Mr. R. C. Bradley showed *Emmelesia albulata*, type from Knowle, and var. *thulæ* from the Shetlands. Mr. W. G. Blatch showed *Mycetoporus punctus* and *Conurus unimaculatus* from Knowle, both new to the Midlands. Mr. G. T. Baker read a paper on the Butterflies of Switzerland; giving a list of species to be collected there, and exhibiting many of the most interesting.

January 5*th*, 1891.—The President in the Chair.

Mr. P. W. Abbott showed *Noctua glareosa* and *Eubolia cervinaria* from Sutton Coldfield. Mr. R. C. Bradley showed *Sciara Thomæ* from Cannock Chase. Mr. W. G. Blatch read a paper on the *Coleoptera* he had collected during two holidays spent in the Church Stretton district in 1890; he showed ninety of the species, all of which were rare and interesting.—Colbran J. Wainwright, *Hon. Sec.*

Lancashire and Cheshire Entomological Society.—The Annual Meeting was held on Monday, January 12th, 1891, in the Free Library, the President (Mr. S. J. Capper, F.L.S.) in the Chair.

Mr. S. J. Capper, F.L.S., F.E.S., was re-elected President; the Rev. H. H. Higgins, Vice-President; Mr. F. N. Pierce, Secretary.

The President then read his Address, giving a summary of the Entomological work of the year, and notices of the more interesting captures in this country.—F. N. Pierce, *Hon. Sec.*, 143, Smithdown Lane, Liverpool.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY: *November 27th*, 1890.—W. H. TUGWELL, Esq., Vice-President, in the Chair.

Mr. R. South exhibited examples of *Melanippe fluctuata*, L., from many localities, and called attention to the var. *costovata*, of Haworth, also to an unusually large specimen from Scotland; he also referred to Millière's figure of the variety known as *neapolisata*, as to which Mr. South expressed an opinion that he had a doubt as to its occurring in England. Mr. Hodges, *Leucania vitellina*, Hb., taken September 26th, 1890; also specimens of *Caradrina ambigua*, Fb., Isle of Wight, August, 1888; and one from Guernsey, September, 1890. Mr. R. Adkin, a series of *Spilosoma menthastri*, Esp., bred from ova received from the North of Ireland, the whole of the moths having a distinct brownish tinge of colour, which was common to both sexes, the specimens also varied much in the arrangement of the spots. Mr. Short, series of the two forms of *Lobophora viretata*, Hb., bred from ova received from the Birmingham district; some discussion took place as to the difference in colour and size of the respective broods; Mr. Short also exhibited three examples of *Spilosoma fuliginosa*, L., from Aberdeen, much larger and paler than those usually received from the north. Mr. Adye, forms of *Anchoscelis lunosa*, Haw., from Christchurch, Hants. Mr. Tugwell, insects from New Caledonia; also long series of *Triphæna comes*, Hb., from English and Scotch localities, and extreme forms from Shetland; the series showed considerable variation, and *T. orbona*, Hufn. (*subsequa*, Hb.), which species the exhibitor remarked was more stable in colour, and the variation was less marked than in *T. comes*. Mr. Billups, foreign *Coleoptera*; also numerous species of *Diptera* taken by him during the past season, among which were *Tetanocera ferruginea*, Fln., *T. elata*, F., *T. punctulata*, Scop., *Acidia cognata*, W., *A. heraclei*, L., *Palloptera arcuata*, Fln., *Limnia marginata*, F., *Platystoma seminationis*, F., &c.

December 11th, 1890.—W. H. TUGWELL, Esq., in the Chair.

Mr. R. Adkin exhibited *Peronea hastiana*, L., bred from larvæ received from the Isle of Man, *Hepialus sylvinus*, taken in Kent. Mr. R. South, *Lycæna Astrarche*, Bgstr., vars. *Allous*, Hb., *Salmacis*, St., and *Artaxerxes*, Fab., and made some observations thereon. Mr. Tugwell, long series of *Eupithecia satyrata*, Hb., English and Scotch, also the var. *callunaria*; also several specimens of an *Eupithecia* from Paisley, which Mr. Tugwell said he could not think were *E. satyrata*. Mr. C. G. Barrett expressed an opinion that they were *E. trisignaria*. Mr. Short, *Epunda lichenea*, Hb., from Portland. Mr. Farrant, a small form of *Hypsipetes sordidata*, Fb., and a Deltoid, which he stated was taken in Somerset. Mr. T. R. Billups, *Masicera sylvatica*, Fen., bred by Mr. Fenn from the larvæ of *Saturnia pavonia*, Schiff.; Mr. Winkley had also bred the same species from *Pieris brassicæ*, L.; *Phorocera concinnata*, Mg., by Mr. Frohawk, from *Vanessa urticæ*, L.; *Trixa variegator*, Mg., from *Chimatobia boreata*, Hb., by Mr. South. Mr. Billups also called attention to three specimens of the rare *Oxycera terminata*, Mg., one of which he had bred from a pupa found in his own garden, Dulwich, August, 1889, the other two being captured in the same locality in August last; he also exhibited several species of *Hymenoptera* parasitic on the ova of *Lepidoptera* and *Diptera*.

January 8th, 1891.—W. H. TUGWELL, Esq., in the Chair.

Messrs. H. Williams and T. J. Washford were elected Members.

Mr. R. Adkin exhibited *Boarmia repandata*, L., bred from ova obtained from a moth taken at Westerham, Kent. During hibernation the larvæ were divided into two equal lots, the one kept on growing privet, and the other on growing birch, each lot produced some few individuals, varying from the majority, but there was no marked difference between the one lot and the other. Mr. Adkin also exhibited *Retinia buoliana*, Schiff., and *R. pinicolana*, Dbl., bred from larvæ collected in the neighbourhood of Poole, the New Forest, and Surrey; those from Poole and the New Forest emerged between June 26th and July 27th, and were all *buoliana*; those from Surrey emerged between July 12th and August 3rd, from July 12th to 22nd, they were all *buoliana*, and from July 25th to August 3rd, they were all *pinicolana*, with the exception of one *buoliana*, bred July 27th. Mr. Tugwell exhibited two series of *Miana strigilis*, St., and *M. fasciuncula*, Haw., and referred to a statement recently made by Mr. Tutt that these two species were only forms of one, he having received forms which were intermediate between the two from Rev. W. F. Johnson, of Armagh. Mr. Tugwell said this statement had considerably surprised him, and he at some length pointed out what he considered were the differences between the two; he also made reference to the published descriptions of the larvæ respectively made by Newman and Buckler; Mr. Fenn remarked that he did not think Newman's descriptions of larvæ were vary reliable, as that gentleman never adopted any system in describing them; he thought also that larvæ varied so much in their different stages that the description of a solitary larva was of very little value; Mr. South expressed an opinion that the two species were undoubtedly distinct, in which opinion Mr. Barrett concurred; Mr. Tutt said that he considered the points of difference alluded to were only superficial: he would, however, at a subsequent meeting, exhibit the specimens he referred to. Mr. Tutt, on behalf of Mr. Reid, of Pitcaple, exhibited long variable series of *Agrotis simulans*, Hufn., *Triphœna comes*, Hb., *Melitœa aurinia*, Rott., *Melanippe fluctuata*, L., and *Abraxas grossulariata*, L.; Mr. Tutt stated that this species had been successfully introduced by Mr. Reid in the vicinity of Pitcaple, and had apparently developed sexual dimorphism, the ♂'s gradually becoming darker, and the ♀'s paler. Mr. Manger exhibited a box of Australian *Coleoptera*.—H. W. BARKER, *Hon. Sec.*

ENTOMOLOGICAL SOCIETY OF LONDON: *January* 21*st*, 1891.—FIFTY-EIGHTH ANNUAL MEETING.—The Right Hon. LORD WALSINGHAM, M.A., F.R.S., President, in the Chair.

An abstract of the Treasurer's accounts having been read by one of the Auditors, the Secretary, Mr. H. Goss, read the Report of the Council. It was then announced that the following gentlemen had been elected as Officers and Council for 1891:—President, Mr. Frederick DuCane Godman, M.A., F.R.S.; Treasurer, Mr. Robert McLachlan, F.R.S.; Secretaries, Mr. Herbert Goss, F.L.S., and the Rev. Canon Fowler, M.A., F.L.S.; Librarian, Mr. Ferdinand Grut, F.L.S.; and as other Members of the Council, Prof. R. Meldola, F.R.S., Mr. Edward Saunders, F.L.S., Dr. David Sharp, F.R.S., Mr. Richard South, Mr. H. T. Stainton, F.R.S, Colonel Charles Swinhoe, F.L.S., Mr. George H. Verrall, and the Right Hon. Lord Walsingham, M.A., F.R.S. It was also announced that the new President would appoint Lord Walsingham, Prof. Meldola, and Dr. Sharp, Vice-Presidents for the session, 1891—1892. Lord Walsingham, the retiring President, then delivered an Address.

A vote of thanks to the President and other Officers of the Society having been passed, Lord Walsingham, Mr. Goss, and Mr. Grut replied, and the proceedings terminated.—H. GOSS, *Hon. Sec.*

A FORTNIGHT IN ALGERIA, WITH DESCRIPTIONS OF NEW *LEPIDOPTERA.*

BY E. MEYRICK, B.A., F.Z.S.

(*Concluded from p.* 13).

CONCHYLIS CHIONOPA, *n. sp.*

♂. 10—11 mm. Head, palpi, antennæ, thorax, abdomen, and legs, white; thorax with a well-developed crest; anterior legs indistinctly banded with fuscous. Fore-wings elongate, rather narrow, posteriorly slightly dilated, costa hardly arched, apex obtuse, hind-margin slightly rounded, oblique; snow-white, irregularly sprinkled with whitish-ochreous, and with faint, obscure, whitish-ochreous markings; a series of small spots along costa, partially very finely sprinkled with blackish; an undefined basal patch; a rather narrow straight median fascia parallel to hind-margin, interrupted beneath costa, marked with some scattered black scales in disc; an undefined transverse streak before hind-margin; a series of minute groups of fine black scales along inner and hind-margin; cilia white, tips whitish-ochreous, base spotted with groups of fine black scales. Hind-wings and cilia snow-white; veins 3 and 4 closely approximated at base.

♀. 9½ mm. Head, &c., as in ♂. Fore-wings shaped as in ♂, but apex more pointed, hind-margin more oblique; white, with two tolerably defined narrow pale ochreous fasciæ, somewhat bent in disc and interrupted below costa, first before one-third, second beyond middle; a pale ochreous spot on costa before apex; no black scales; cilia white. Hind-wings as in ♂.

Biskra; four specimens (3 ♂, 1 ♀), all obtained by searching at the roots of the same individual plant (a little shrubby desert plant, unknown to me). Hence I have no doubt that the sexes are correctly referred to the same species, in spite of the remarkable differences in marking of the fore-wings. The species belongs to the *straminea* group, but is very distinct from any known to me.

Ptocheuusa osseella, Stt.—Philippeville; five specimens. These are a small and pale form, and perhaps slightly narrower-winged than English types, but there is no other difference; the quite peculiar neuration is identical.

APODIA DOLIODES, *n. sp.*

♂ ♀. 16—17 mm. Head in ♂ whitish, in ♀ whitish-fuscous. Palpi long, whitish, second joint dark fuscous except at apex, terminal joint sometimes with a dark fuscous longitudinal line in front. Antennæ fuscous, in ♂ serrate, ciliations ⅔. Thorax light fuscous. Abdomen grey, apex in ♂ whitish. Legs dark fuscous, apex of joints whitish, hairs of posterior tibiæ pale greyish-ochreous. Fore-wings elongate-lanceolate; light fuscous, more or less densely irrorated with whitish and darker fuscous; a cloudy, obscure, dark fuscous, subelongate dot in middle of disc, and a second before three-fourths; cilia pale whitish-fuscous, with two ill-defined fine dark fuscous lines, sub-basal and median. Hind-wings hardly 1, apical projection half as long as breadth of wing, hind-margin somewhat projecting on vein 5; grey; cilia pale ochreous-greyish.

Philippeville; three specimens. An obscure-looking insect superficially, but possessing the full structural characters of *Apodia*, which is a good genus (neuration: fore-wings, 7 and 8 out of 6; hind-wings, 3 and 4 widely remote, 5 nearer 6 than 4, 6 and 7 separate).

APODIA PSAMATHIAS, *n. sp.*

♂ ♀. 9 mm. Head and thorax ochreous-whitish, sprinkled with dark fuscous Palpi whitish, second joint with sub-basal and broad subapical blackish bands, terminal joint with subapical blackish band. Antennæ whitish, annulated with dark fuscous. Abdomen whitish-ochreous. Legs ochreous-whitish, banded with dark fuscous. Fore-wings lanceolate; whitish-ochreous, irrorated with fuscous and blackish; a dark fuscous dot at base; a short, cloudy, dark fuscous mark from costa near base; six more or less distinct, cloudy, dark fuscous or blackish dots, viz., two on costa at one-sixth and one-third, two on fold somewhat obliquely beyond these respectively, one (sometimes large) in middle of disc, and one in disc at three-fourths; cilia ochreous-whitish, with three partially interrupted lines of dark fuscous scales (sub-basal, median and subapical). Hind-wings two-thirds, apical projection two-thirds of breadth of wing; pale grey; cilia whitish-ochreous.

Biskra; two specimens. In neuration and other essential characters identical with the preceding, but very different superficially. Here, as in most other species, diminution of size and paleness of colouring are concomitants of the desert habitation.

CALYPTROTIS, *n. g.*

Head smooth; ocelli present; tongue well developed. Antennæ three-fourths, in ♂ serrulate, shortly ciliated, basal joint moderately long, densely scaled, with dense pecten of long hair scales. Labial palpi long, recurved, with loosely appressed scales, second joint long, terminal joint less than half second, pointed. Maxillary palpi very short, appressed to tongue. Posterior tibiæ clothed with very long dense hairs. Fore-wings with vein 1 long-furcate, 2 from two-thirds of cell, 3 from angle, 4 and 5 approximated at base, 7 and 8 stalked, 7 to costa, 11 from middle of cell. Hind-wings four-fifths, trapezoidal, hind-margin deeply sinuate beneath pointed produced apex, cilia 2; veins 3 and 4 remote, 5 approximated to 4 at base, 6 and 7 widely remote and parallel.

This genus, structurally related to *Monochroa*, is immediately separated from that and all its nearest allies by the strongly developed and conspicuous scale-pecten of the basal joint of antennæ, which in them is entirely absent. The very short terminal joint of the palpi is also a noticeable character.

C. ALPHITODES, *n. sp.*

♂ ♀. 13—16 mm. Head white, with a few black scales. Palpi white, more or less irrorated with black externally. Antennæ white, annulated with black. Thorax white, sprinkled with black, apex of patagia and posterior extremity black. Abdomen whitish. Legs white, banded with black irroration. Fore-wings lanceolate; white, more or less tinged with pale greyish-ochreous in disc, and irregularly irrorated throughout with black; the increase of this irroration tends to form two small spots obliquely placed beneath costa near base, a cloudy, somewhat oblique bar extending from costa beyond one-third to the fold, a small erect spot on anal angle, and a narrow streak along hind-margin; cilia white, irrorated with black. Hind-wings pale grey; cilia whitish, slightly ochreous-tinged.

Biskra; a series obtained one evening from some sheltered shrubs near the river bank.

GELECHIA EREMAULA, *n. sp.*

♂ ♀. 11–12 mm. Head and thorax brownish, face white. Palpi internally whitish, externally black, with apex and a sub-basal band of both second and terminal joints brown (appearing white when worn). Antennæ brownish, obscurely annulated with black. Abdomen grey, sides whitish. Legs blackish, ringed with white, hairs of posterior tibiæ white. Fore-wings elongate-lanceolate; ochreous-brown, mixed with reddish-ochreous, and irrorated with whitish-ochreous and black; a narrow, cloudy, oblique, black bar from costa before one-third to fold, dilated posteriorly in disc; a small black spot in disc before middle, a black dot obliquely beyond this on fold, and another in disc beyond middle; an ochreous-whitish spot on costa at three-fourths, and a short, somewhat oblique, ochreous-whitish streak from inner margin opposite it, not meeting; apical area beyond this much suffused with black, and very obscurely spotted on margins with ochreous-whitish: cilia pale whitish-ochreous, basal half irrorated with black, and limited by a fine black line. Hind-wings one, apex one-third as long as breadth of wing, hind-margin somewhat projecting on vein 5, cilia $1\frac{2}{3}$; light grey, thinly scaled towards base, darker towards apex and hind-margin: cilia whitish-ochreous, greyish-tinged.

Biskra; beaten in plenty from a common thorny desert shrub, and also three specimens bred from larvæ feeding in spun shoots of the same plant. The description is taken from the bred specimens; those taken on the wing are usually worn, when the black scales largely disappear, and the insect becomes much lighter and more ochreous-looking. The species belongs to the group separated by Heinemann under the name *Lita*, but not truly distinguishable from *Gelechia*; it may be said to be intermediate between *maculiferella* and *obsoletella*, probably nearer the former, but a much more uniformly coloured insect, without white markings.

G. obsoletella, F. R.—three specimens at Biskra, amongst what I believe was an *Atriplex*; they do not appear to differ at all from English types. *G. sp.*—one specimen from Biskra of an indeterminate species allied to *obsoletella*, but more strongly marked.

Psecadia lipunctella, F.—Constantine; one at light, and a second on a fir stem.

ŒCOPHORA XENIAS, *n. sp.*

♀. 11 mm. Head whitish-grey. Palpi grey, sprinkled with dark grey and whitish. Antennæ grey. Thorax light grey. Abdomen whitish-grey. Legs dark grey, apex of joints and hairs of posterior tibiæ grey-whitish. Fore-wings lanceolate; light grey, with scattered dark grey and whitish scales; an elongate white suffusion in disc from one-fourth to three-fourths; a minute black dot in disc beyond middle; five cloudy, rather large, dark fuscous spots, viz., two transversely placed in disc at one-third, one above middle, one in disc at two-thirds, and one on anal angle: cilia grey-whitish, with some grey scales at base. Hind-wings light grey: cilia grey-whitish, faintly ochreous-tinged.

Philippeville; one specimen. This is a true *Œcophora,* and very distinct from any described European form, but has much similarity to some Australian species.

Glyphipteryx Fischeriella, Z.—two specimens at Bougie.

Plutella cruciferarum, Z.—fairly common in the desert at Biskra, where cruciferous plants resembling *Cardamine* form a not inconsiderable proportion of the vegetation.

Micropteryx aureatella, Sc.—abundant on the hills at Philippeville and Bougie, on flowers or flying in the sun, and also taken at Elkantara; varied much. *M. isobasella,* Stgr.—plentiful in a restricted swampy locality at Philippeville, sitting on various flowers. None of the specimens showed the character of *M. calthella* and the species would appear to be as good as others in the genus.

Nemophora Schwarziella, Z.—three specimens from Philippeville, which are probably this species; they are, however, greyer, and the hind-wings are somewhat more transparent than in English types.

SCIOPETRIS, *n. g.*

Head rough-haired; ocelli present; tongue absent. Antennæ two-thirds, in ♂ filiform, clothed with rather long pubescence (2), basal joint moderate, stout, with well developed pecten. Labial palpi rather short, porrected or drooping, with loose projecting hair-scales. Maxillary palpi obsolete. Posterior tibiæ with appressed scales. Fore-wings with vein 1 furcate, 2 from two-thirds of cell, 7 absent, 10 absent, 11 from before middle of cell. Hind-wings under one, elongate-ovate, cilia 1; vein 3 remote from 4, 4 and 5 from a point or stalked, 6 and 7 parallel. (♀ probably apterous).

Nearly allied to *Talæporia,* from which it differs essentially by the absence of veins 7 and 10 of fore-wings.

S. TECHNICA, *n. sp.*

♂. 10–11 mm. Head and palpi pale yellowish. Antennæ dark fuscous. Thorax pale yellowish, mixed with pale fuscous. Abdomen and legs grey. Fore-wings elongate, somewhat dilated posteriorly, costa slightly sinuate, strongly arched before apex, apex obtuse, hind-margin obliquely rounded, continuously with inner margin; pale whitish-ochreous, yellowish-tinged; a series of small fuscous spots along costa and hind-margin; irregular fuscous strigulæ from some of these cross disc; an irregular fuscous fascia from middle of costa to middle of inner margin: cilia grey, base obscurely spotted with whitish-ochreous. Hind-wings thinly clothed with hair-scales; grey: cilia light grey, towards anal angle ochreous-tinged.

Philippeville; three specimens from sheltered rock-faces.

ERIOCOTTIS PYROCOMA, *n. sp.*

♂ ♀. 13–14 mm. Head orange, face dark fuscous. Palpi dark fuscous, internally yellowish. Antennæ black, obscurely annulated with grey-yellowish. Thorax light bronzy. Abdomen dark grey. Legs grey, posterior pair suffused with ochreous-whitish. Fore-wings elongate, moderate, costa moderately arched, apex rounded, hind-margin oblique, slightly rounded; ochreous-bronzy, posteriorly more or less irrorated or wholly suffused with pale ochreous: cilia light ochreous. Hind-wings dark grey; cilia grey, base darker.

Generally common amongst the taller and more sheltered scrub at Philippeville and Bougie. It is nearly related to the described species of the genus, but instantly recognisable by the orange head.

Tineola biselliella, Humm.—one specimen taken at Biskra of what is probably a form of this species, but the face is much browner than usual.

Nepticula aurella, Stt.—Philippeville; one beaten from bramble.

Trifurcula immundella, Z.—Bougie; one specimen, somewhat dark, but otherwise not apparently different.

Acrolepia vesperella, Z.—Philippeville and Bougie; four specimens. *A. granitella*, Tr.—several taken at Kharata, and others bred from larvæ found mining the leaves of *Inula* at Bougie.

Prays oleellus, F.—Philippeville; one specimen.

Zelleria phillyrella, Mill.—Philippeville; one specimen.

Blastobasis phycidella, Z.—Bougie; two specimens.

Coleophora fuscicornis, Z.—Constantine; one amongst low herbage. *C. fretella*, Z.—one specimen from Bougie which agrees well with this species, except that the pale discal streaks are extremely faint.

C. PARTHENICA, *n. sp.*

♀. 16 mm. Head and thorax white. Palpi filiform, untufted, white. Antennæ white, annulated with dark fuscous, basal joint with thick, rather short tuft, stalk thickened above with white scales on basal fourth. Abdomen white, last two segments black at base in middle. Legs ochreous-whitish. Fore-wings elongate-lanceolate; ochreous-white: cilia white. Hind-wings greyish-white: cilia ochreous-white.

Biskra; one specimen. Probably nearest *C. vestalella.*

C. sp.—an indeterminate, unicolorous, whitish-ochreous species, without tufts of antennæ or palpi, and with grey hind-wings, of which I took one specimen at Biskra. *C. sp.*—one specimen of a species of the *argentula* group, from Biskra. Besides these, I found three larvæ of a *Coleophora* feeding on grass at Elkantara, with cases resembling those of *C. alcyonipennella*; and another species, with a case somewhat like that of *C. phlomidella*, feeding in plenty at Biskra on a desert plant whose affinity I could not conjecture, as it was not in flower; I unfortunately failed to rear these.

CALYCOBATHRA, *n. g.*

Head smooth, forehead and face with very large, flat, pearly scales; ocelli apparently absent; tongue well developed. Antennæ two-thirds, in ♂—(?), basal joint dilated to form a large concave eye-cap. Labial palpi long, recurved, slender, smooth-scaled, terminal joint as long as second, acute. Maxillary palpi very short, appressed to tongue. Posterior tibiæ with rough projecting hairs above and beneath.

Fore-wings with vein 1 furcate, 2 from near angle, 7 and 8 out of 6, 7 to costa, 11 from middle of cell. Hind-wings one-third, linear, cilia 7; veins 2—5 separate, 6 and 7 stalked.

Allied to *Stathmopoda*, from which (as from nearly all genera of the *Elachistidæ*) it is immediately separable by the basal eyecap of the antennæ.

C. ACARPA, *n. sp.*

♀. 11 mm. Head, palpi and thorax pale whitish-ochreous. Antennæ fuscous, basal joint whitish-ochreous. Abdomen pale whitish-ochreous, apical segment black beneath and on sides. Legs ochreous-whitish, anterior and middle pair obscurely banded with fuscous. Fore-wings elongate-lanceolate, long-pointed; pale whitish-ochreous; some veins in disc and towards costa posteriorly obscurely lined with fuscous: cilia pale whitish-ochreous. Hind-wings grey: cilia pale whitish-ochreous, greyish-tinged.

Biskra; one specimen.

ISCHNOPHANES, *n. g.*

Head smooth; ocelli absent; tongue well developed. Antennæ two-thirds, in ♂ serrulate, simple, basal joint long, considerably dilated with loose scales. Labial palpi moderately long, curved, ascending, slender, smooth-scaled, apex of second joint very slightly projecting beneath, terminal joint rather shorter than second, acute. Maxillary palpi very short, appressed to tongue. Abdomen flattened. Posterior tibiæ clothed with long hairs above. Fore-wings with vein 1 furcate, 2 from angle of cell, 5 absent, 6 absent, 7 to costa, 8 absent, 11 from middle of cell. Hind-wings one-half, linear, costa bent near base, cilia 6; cell open between 3 and 7, 4 absent, 5 absent, 6 absent.

Allied to *Batrachedra*, but sufficiently distinct by the enlarged basal joint of antennæ, and degraded neuration.

I. MONOCENTRA, *n. sp.*

♂ ♀. 7–8 mm. Head and palpi ochreous-whitish. Antennæ whitish, annulated with dark fuscous. Thorax and abdomen pale whitish-ochreous. Legs ochreous-whitish. Fore-wings elongate-lanceolate, apex slenderly produced; pale whitish-ochreous, towards apex very minutely speckled with blackish; a round black dot in disc at three-fourths, sometimes obsolete: cilia pale whitish-ochreous, finely sprinkled with blackish round apex. Hind-wings whitish-grey: cilia very pale whitish-grey-ochreous.

Abundant amongst some low herbage on the sand near the river at Biskra, flying freely about sunset on the one calm evening, but not afterwards obtainable.

Limnœcia phragmitella, Stt.—I saw *Typha*-heads infested with the larvæ of this very wide-ranging species (which extends to New Zealand) in the neighbourhood of Setif, but did not take any.

Elachista argentella, Cl. (*cygnipennella*, Hb.).—Philippeville and Constantine; five specimens. In all of these the stalk of veins 6 and 7 of the hind-wings is much shorter relatively than in English specimens; in the latter it is fully one-half of the entire length of the veins, in the former not more than one-fourth; this is an interesting instance of geographical variation of structure, but probably from intermediate localities connecting forms would be obtained. Algerian specimens are also somewhat smaller, and have the hind-wings darker grey, but do not differ in this respect from South European forms. *E. disertella*, H.-S.—Philippeville; three specimens.

E. ECHIDNIAS, *n. sp.*

♀. 9 mm. Head light grey, face whitish. Palpi white, second joint externally dark fuscous except apex, terminal joint with base and three rings dark fuscous. Antennæ dark grey, basal joint dark in front. Thorax grey, apical half of patagia ochreous-whitish. Abdomen ochreous-grey-whitish, apical segment beneath and on sides with a plate of black hair-scales, partially concealed beneath pearly, flat scales, but probably expansible. Legs dark grey, apex of joints and hairs of posterior tibiæ whitish. Fore-wings lanceolate; dark grey, sprinkled with whitish; an irregular whitish streak from base beneath costa to one-third, thence curved down, passing through middle of disc and curved back to costa at two-thirds; two cloudy blackish dots beneath this streak at one-third and two-thirds of disc, each followed by an obscure, whitish, transverse mark connecting streak with inner margin; a very acutely angulated, fine, black, transverse line near before apex: cilia whitish-grey, base mixed with dark grey scales round apex. Hind-wings grey: cilia whitish-grey.

Biskra; one specimen. This is a singularly distinct species, yet in a manner intermediate between the pale species and the *nigrella* group.

Urodeta cisticolella, Stt.—one specimen at Philippeville.

Tischeria marginea, Hw.—Philippeville; commonly beaten from bramble. The circumstances of capture leave no doubt that these specimens belong to a bramble-feeding species, and I consider them certainly a geographical form of *marginea*; but the fore-wings are more or less wholly suffused with ferruginous, and the insect appears much darker, the black dot at the anal angle being obliterated. Specimens from the South of France in Mr. Stainton's collection made no approach to this colouring.

Bucculatrix cratægi, Z.—Philippeville; three specimens.

Cemiostoma susinella, H.-S.—two specimens beaten from aspen at Philippeville.

Coriscium Brongniardellum, F.—Constantine; one specimen. I consider the identification safe, but the specimen differs from any English types that I have seen, being a dark obscure form, with the white markings nearly obsolete.

LITHOCOLLETIS IDOLIAS, *n. sp.*

♂. 8 mm. Head and thorax bright saffron, face and palpi silvery-white. Antennæ whitish-saffron, beneath white. Abdomen grey, anal tuft whitish-ochreous. Legs whitish, median band and apex of anterior and middle tibiæ, and apex of some tarsal joints, black. Fore-wings lanceolate; light golden-orange; costa whitish-tinged on anterior half; three fine outwardly oblique black lines from costa before, in, and beyond middle, reaching half across wing, obtusely bent downwards in middle, but lower portion sometimes obsolete, space between first two whitish towards costa, third obscurely margined posteriorly with whitish; two faintly paler, oblique, fascia-like spots from inner margin, reaching half across wing, first before middle, hardly traceable, second beyond middle, its apex produced posteriorly as a longitudinal projection in disc to three-fourths, and enclosed with fine black lines in disc only; a fine, black, oblique line from inner margin before anal angle, not reaching half across wing, obscurely whitish-margined posteriorly; a very minute black apical dot: cilia whitish, base within a fine black line pale saffron, costal cilia with two very fine black bars. Hind-wings grey: cilia whitish-grey.

Philippeville; two specimens, both, I think, beaten from a species of *Quercus*. The species is curiously marked, owing to the obsolescence of some of the ordinary streaks, and is allied to *L. delitella*.

Ramsbury, Hungerford:
September, 1890.

HOLIDAY CAPTURES OF *LEPIDOPTERA* IN SWITZERLAND IN 1886.

BY G. T. BAKER, F.L.S.

In continuation of my former notes on our holiday in 1886, we left Heidelberg about the 22nd of June, and skirting through a part of the Black Forest, arrived late the same evening at Lucerne, where we stayed a couple of days, after which we took the boat for Stansstad, and from thence drove up the valley of the Aa to Engelberg; this, though beautiful, by no means equals many of the valleys of Canton Valais, whilst the insect life was likewise less numerous. After a rest and lunch at Engelberg, we proceeded with our "Knecht" (to carry the "Baggage") over the Joch Pass to Engstlen, my wife on horseback and I on foot; but, unfortunately, as we neared the foot of the Pass, the snow became very low indeed, and as it was also very soft, it stopped the riding, and the most trying part of the way had to be performed by us both on foot, so that by the time we arrived at the Engstlen Alp, it was almost dark, and was also pouring with rain. We had arranged to stay here ten days or a fortnight, and after the long and fatiguing work of the previous day, were not very distressed to have the rest of a wet day awaiting us on the following morning. The next day, however, the weather began to clear, and we soon felt the power of the Alpine sun. The Engstlen Alp and Lake is a beautiful spot: a small level mountain pasture of somewhat over 6000 feet, closely surrounded with snow peaks, and with the magnificent Wetterhorn in the near distance towards Meiringen. A most delightful twelve days we had here, and rather regretted having arranged to spend a week at Engelberg on our homeward way. Looking back, however, I think we had almost as profitable collecting in the one place as the other, and if the scenery was not quite so fine, still it was very beautiful, having as a background the dome-shaped Titlis towering at the end of the valley. There is here a considerable school and monastery, which owns a great part of the rich pasture land of the valley; and we were struck by the fact that the peasantry of this part of Switzerland seem much more prosperous and well-to-do than those of the southern Cantons.

In giving a detailed list of my captures, I shall, as usual, follow the order of Staudinger's catalogue.

Papilio Machaon, Engstlen Alp.

Parnassius Apollo, Engelberg; *Mnesnosyne*, Engstlen and Tannen Alps. I took this commonly about 6500 feet high. Frey says in his Lepidopteren der Schweiz, p. 3, highest about 5000 feet (Paris feet, equal to say 5328 English feet), and as I took it very near the top of the Tannen Alp, the species evidently flew a good deal higher than the late much esteemed Professor was aware.

Aporia cratægi, Engelberg.

Pieris brassicæ and *napi*, Engelberg, v. *bryoniæ*, Engstlen. I also took a very pretty ♀ of the usual *napi* flying among the var. *bryoniæ*. *Callidice*, Engelberg.

Anthocharis cardamines, Engelberg and Engstlen.

Colias Hyale, Engelberg.

Polyommatus Hippothoë, Engelberg; most abundant, also v. *Eurybia* and v. *Stieberi*; this latter may have been unusual for Switzerland, but it is indistinguishable from some Lapland forms I have. *Dorilis*, v. *subalpina*, Engelberg.

Lycæna Ægon, *Argus*, and v. *argyrognomon*, Engelberg; *Pheretes*, Engstlen; *Astrarche*, Engelberg and Engstlen, ab. *Allous*, Engelberg; *Icarus*, and ab. *Icarinus*, Engelberg. I also took at this place (Engelberg) some half dozen specimens of a "Blue" I could not make out, they appeared to be a small variety of "*Lycidas*," but the spots were smaller and the metallic markings subdued; however, on submitting them to my friend Dr. Staudinger, he has pronounced them to be a curious form of "*Icarus*." *Eumedon*, Engstlen; *Corydon*, *Hylas*, Engelberg; *minima*, *semiargus*, *Arion*, Engstlen and Engelberg.

Vanessa urticæ, and *cardui*, Engelberg.

Melitæa Cynthia, Joch Pass; *Dictynna*, *Athalia*, Engelberg; both of these were very abundant indeed.

Argynnis Euphrosyne, Engelberg and Engstlen; *Pales*, Engstlen, a pest literally; *Niobe*, and v. *Eris*, Engelberg.

Erebia, v. *Cassiope*, Engstlen and Engelberg; *Melampus*, *Manto*, and *Tyndarus*, all Engstlen, not rare.

Oeneis Aello, Engstlen and Tannen Alps.

Pararge Mæra, Engelberg.

Epinephile Hyperanthus, Engelberg.

Cœnonympha Pamphilus, everywhere.

Syrichthus Alveus, and v. *fritillum*, v. *cæcus* and *cacaliæ*, all from Engstlen; *serratulæ*, Engelberg.

Nisoniades Tages, Engstlen.

Hesperia Thaumas and *sylvanus*, Engelberg.

Macroglossa stellatarum, Engstlen.

Ino chrysocephala, Engstlen, v. *Heydenreichii*, Engelberg ; most of these latter form a transit to v. *Heydenreichii*.

Zygæna, v. *nubigena* and *filipendulæ*, Engelberg.

Nudaria mundana, Engelberg ; one specimen sitting on the wall in the hotel.

Setina ramosa, Engstlen.

Lithosia complana, Engelberg.

Nemeophila russula, Engelberg ; *plantaginis*, ab. *Hospiton*, and ab. *matronalis*, Engstlen ; larvæ abundant in all stages, from which I reared the three forms.

Psyche plumistrella, Joch Pass.

Dasychira pudibunda, Engelberg.

Leucoma salicis, Engelberg.

Bombyx lanestris, larvæ, Engelberg ; v. *roboris*, flying wildly in the hot sunshine high up (over 7000 feet) on the Tannen Alp.

Agrotis simplonia ; I took one specimen, a very dark form, on the Engstlen Alp.

Mamestra nebulosa (plebeia), and *glauca*, Engstlen ; both of these species came to light not infrequently.

Plusia tripartita (*Abrostola urticæ*), Engelberg.

Anarta, v. *rupestralis*, Joch Pass.

Prothymia viridana, Engstlen.

Euclidia glyphica, Engstlen and Engelberg.

Herminia tentacularia, Engelberg.

Jodis lactearia, Engelberg.

Acidalia perochraria, v. *fumata*, Engelberg.

Cabera exanthemaria, Engelberg.

Psodos alpinata and *quadrifaria*, Engstlen ; I found *alpinata* specially common in a beautiful pasture high up in the Tannen Alp.

Ematurga atomaria, Engstlen.

Phasiane clathrata, Engstlen.

Scoria lineata (*dealbata*), Engelberg.

Ortholitha limitata, Engelberg.

Odezia atrata, Engelberg and Engstlen.

Cidaria berberata, Engelberg ; *montanata*, everywhere ; *fluctuata*, Engstlen ; *turbata*, *molluginata*, *ferrugata*, *nebulata*, *incultaria*, *tristata*, *hastata*, v. *subhastata*, *minorata*, *adequata*, Engstlen ; *bilineata* and *obliterata*, Engelberg ; *albulata*, everywhere.

Eupithecia impurata, Engelberg ; *satyrata* and *silenata*, Engstlen.

Hercyna Schrankiana, *phrygialis*, and *sericealis*, all fairly abundant at Engstlen.

Botys nigralis, Engelberg ; *octomaculata*, *cingulata*, *ostrinalis*, *cespitalis*, Engstlen, *opacalis* ; *decrepitalis*, *uliginosalis*, *crocealis*, and *pandalis*, all from Engelberg.

Diasema litterata, Engelberg.

Crambus pratellus, Engstlen ; *dumetellus*, *hortuellus*, Engelberg and Engstlen ; *conchellus*, *margaritellus*, Engelberg ; *pyramidellus*, Engstlen ; *coulonellus*, the commonest *Crambus* at Engstlen ; *perlellus* and *Warringtonellus*, Engelberg.

Asarta æthiopella, Engstlen.

Catastia v. *auriciliella*, Engstlen and Engelberg.

Tortrix corylana, and *viburnana*, Engstlen.
Sciaphila Wahlbomiana, Engstlen.
Penthina lacunana, Engelberg.
Grapholita cirsiana, Engstlen and Engelberg.
Nemotois metallicus, Engelberg.

I have several plumes and *Phycidiæ*, which are as yet unnamed; and had not the season of 1886 been very backward indeed, and with an unusual amount of snow, the probabilities are that our list would have been considerably extended.

16, Clarendon Road, Edgbaston,
Near Birmingham:
September 25*th*, 1890.

NOTES ON SOME BRITISH AND EXOTIC *COCCIDÆ* (No. 19).

BY J. W. DOUGLAS, F.E.S.

PLATE I.

LECANIUM SAROTHAMNI, *n. sp.*

♀ scale, adult; oval, very convex, chestnut-brown, shining, smooth, on the sides only and extending to the margin 8—9 short, transverse black lines, very slightly raised and not very perceptible (sometimes wanting entirely), amongst which are slight confluent punctures, sometimes also a few punctures on the disc. Eventually, when the scale becomes quite dry and empty, all the punctures become deeper, especially on each side of the smooth median line, which thus is sometimes rendered slightly but obtusely carinate. Anal cleft short, the point above it very small, not projecting. Antennæ (fig. 2a) very small, of 7 joints; 1st and 2nd widest, in length subequal; 3rd longest, nearly as long as the remaining four together, with two long hairs near the apex; 4th, 5th and 6th each successively shorter and narrower, the 5th with one very short hair; 7th very small, with several long hairs. Legs (fig. 2b) long, slender; tibiæ scarcely wider than the tarsi, but a trifle longer; tarsi with two long digitules very finely clubbed; claw short, obtusely pointed, with two short, dilated digitules. There are two hairs on the trochanter, and three on the femur, but none evident on the tibiæ and tarsi of the three specimens examined, thought it is possible they may have been rubbed off in the preparation for the microscope. Length, 4—5, breadth, 4, height, 3 mm.

Larvæ very small, pale yellowish, present no tangible features to distinguish them from those of other *Lecania*.

I am indebted to Mr. R. Newstead, Grosvenor Museum, Chester, for the great pains he has taken in preparing specimens and making drawings of the antennæ and legs.

In September, 1889, Dr. T. A. Chapman, Hereford, sent some scales which he had just then found on stems of broom (*Sarothamnus scoparius*). In some respects these seemed to be like *Lecanium genistæ*, Sign. (Ess. Cochen., p. 235), which Signoret found abundant in the pine forests on the coasts at Hyères and Cannes, on *Genista anglica*;

but in that species the scales are 8 mm. long by 4 broad, being, Signoret says, one of the largest species found in France. The scales I received were dry and empty, and the stems of broom to which they were attached were dead when found, so it seemed possible that the life of the insects had been arrested, and the length of the scale restricted to 5 mm. by the premature death of the food-plant, and I determined to wait a year for the solution of the question.

This season Dr. Chapman has sent several scales on three occasions; in all of them the *insect* was mature, and the scale full of very small white eggs, but the scale itself differed each time. On June 17th the insects were alive, and the scales (not yet firm) had attained nearly the full size, but were yellow-brown, smooth though very finely punctured, and had 8—9 narrow black lines extending across from margin to margin at equal distances apart, the lines strongest on the anterior part of the scale. On June 21st the scales were redder-brown, the transverse black lines a trifle raised, the punctures generally, especially on each side of the median line, deeper and more conspicuous. On July 10th the black lines had in most cases disappeared from the disc, and remained on the sides towards the margins only, or in some instances had quite vanished. This last consignment of scales was attached to vigorous living shoots of broom, and the maximum length of 5 mm. was not in any case exceeded, so that the full growth had been attained.

The male in any stage was not obtained.

This species on the broom differs materially from *L. genistæ* on the allied Petty-whin, inasmuch as that species, as described by Signoret, has scales nearly twice as long (8 mm.), and no mention is made of the very characteristic black lines; the antennæ also are described as of 8 joints; the 3rd, 4th and 5th longest and subequal, the 5th at the apex with three hairs, of which one is very long; 6th and 7th equal, the latter with three short hairs; 8th twice as long as the 7th, with eight to ten hairs; tibiæ and tarsi slender, the former one-fourth longer than the latter; claws broad at the base, with one of the digitules a little larger than the other.

Dr. Chapman informs me that the scales are gregarious on the under-side of last year's shoots of the broom, attached by preference to sloping or horizontal branches, and, curiously, to a great extent to such as were in a dying state. The death of the branches Dr. Chapman attributes to the attack of an Aphid with which they are infested. He sent some examples to Mr. Buckton, who says they are the common *Siphonophora pisi*, Kalt. (Brit. Aphides, vol. i, p. 134, pl. xiv), a general feeder, but particularly attached to *Papilionaceæ*, and in some years very destructive to peas and other farm crops. I apprehend that the *Lecania* also helped to pump out the life of the broom.

The female *Lecania*, as a rule, fix themselves in early life, and remain attached to the same site for the remainder of their existence. "J'y suis, j'y reste," might be their family motto. But Dr. Chapman tells me that these on the broom were still on the move in May, the probable reason being, I think, that they found the supply of sap on which they depended for a living was getting short, or it may be deteriorated in consequence of the additional absorption of it by their fellow-squatters, the Aphids, and so they felt compelled to shift to "fresh *wood* and pasture new," a proceeding they would not otherwise have adopted. I once witnessed a similar migration of young, full-sized females of *Lecanium beaumontiæ*, which moved about freely on the withering stems of *Beaumontia grandiflora*, on which they had come to me (*cf.* Ent. Mo. Mag., vol. xxiv, p. 95).

LECANIUM CILIATUM, *n. sp.*

♀ scale, mature. Ochreous to light brown; outline variable, broad rounded oval (fig. 3a profile, fig. 3b front view), or at times irregular narrow oval, or transversely oval, broadly rounded at the sides, being then broader than long (length, 5, breadth, 6 mm.); in all cases the middle portion is occupied by a high, broad, smooth, fusiform swelling, of which one point is close above the small anal cleft, the other not extending to the anterior margin by a considerable space; the top with two distinct rows of deep, more or less large, punctures; the entire elevation resembling a convex, pointed scale, superimposed on a broader, flatter one; the remainder of the surface of the scale being comparatively flat, and covered with a reticulation of confused lines and confluent punctures; the entire margin with a fringe of fine concolorous hairs (Mr. Newstead says these are white and conspicuous to the naked eye in the living insect), which become more or less abrated in the dry scale. Antennæ (fig. 3c) of 7 joints; 1st stout, widest; 2nd not quite so long; 3rd as long as the 4th, 5th and 6th together, without hairs, these three latter in length subequal, the 4th a trifle the longest, the sides suddenly constricted in the middle, where there are one very long and one very short hair placed together on one side, and a still shorter one on the opposite side; a single long hair on the 1st, 2nd and 5th joints, two on the 6th, and about six on the 7th.

"Tibiæ about twice the length of the tarsi, constricted at about one-third of the distance from the apex. Tarsal digitules long, more than two-thirds the length of the tarsi"—(R. NEWSTEAD). Length, 5·5, breadth, 5 mm.

"♂ scale (fig. 3d), glossy white, elongated, convex, with one central and two lateral square, granular projections, some of the posterior ones double; margin with a rather strong, glassy fringe. The only specimen I possess has the posterior portion wanting, the imago having escaped before I discovered it."—(R. N.).

"Larvæ large, dark yellow; antennæ of 6 joints; 1st widest, oval, in length equal to the 4th and 5th; 2nd shortest, with one long hair; 3rd longest, with two long hairs; 4th and 5th equal, the 4th with one long hair on the under- and one on the upper-side, 5th with one very long hair; 6th nearly as long as the 4th and 5th, with two long and three or four shorter hairs, the longest arising from the middle of the joint. Tibiæ and tarsi of nearly equal length, the former with several hairs, the latter with two long ones. Anal cleft deep. The larvæ, which appear a month later than *L. fuscum*, are larger than those of any other species of *Lecanium* that I have examined."—(R. N.).

In the third week of June in the years 1887, 1888 and 1889, Mr. G. C. Bignell, of Stonehouse, Devon, sent on each occasion a single example of this very remarkable scale, they being all he could find on an oak (*Quercus robur*) in his locality, and as they had some resemblance to Réaumur's fig. 8, pl. 6 (*Pulvinaria lanatus*, Gmel., Sign.), it seemed possible that they might be that species before the development of the ovisac represented in the figure, and so I have waited for more examples. This year I requested Mr. Newstead to look for such scales, and on July 26th he obtained several on oaks in Delamere Forest, some of them having eggs within them, proving that they were not *Pulvinaria*, which has an external ovisac. The species does not appear to have been described or figured by Réaumur, Planchon, Signoret, or any other author. Unlike *L. fuscum*, which is found among the buds at the ends of the last year's shoots of oaks, this was seen by Mr. Newstead only on branches four or five years old, and far from their termination.

I am greatly indebted to Mr. Newstead for searching for this species, and also for the notes of his observations and the excellent figures reproduced on the plate.

153, Lewisham Road, S.E.:
October, 1890.

ON THE NEW AUSTRALIAN VINE PEST.

BY E. BERGROTH, M.D.

The Australian newspapers of 1890 have contained many accounts of the occurrence in immense multitudes of a Hemipterous insect injurious to the vineyards and orchards in New South Wales and Victoria. The government entomologist of N. S. W., Mr. French, has found a mixture of strong benzole to be the best remedy against it. At the Meeting of the Linnean Society of N. S. W. on February 26th, 1890, Mr. Fred. A. A. Skuse, the well known Dipterist, exhibited specimens of the insect, stating that it belonged to the family *Capsidæ*, and was related to the American Chinch bug. In a recent number of

"Insect Life," it is recorded as a species of *Phytocoris*. As, however, the American Chinch bug (*Blissus leucopterus*, Say) does not belong to the *Capsidæ*, and as Mr. Skuse states that the insect has ocelli, it was clear that there must have been some error in the determination. A few weeks ago Mr. Skuse kindly submitted several specimens of the vine bug to me, which enables me to state that it has nothing to do with the *Capsidæ*, but belongs to the genus *Nysius*, Dall., of the family *Lygæidæ*, a genus not hitherto known from the Australian continent.

After having compared it with the descriptions of all hitherto known species of *Nysius*, I must conclude that it is not an introduced species, and I do not hesitate to describe it as new.

NYSIUS VINITOR, *n. sp.*

Elongatus, subopacus, colore variabilis, bucculis basin capitis versus evanescentibus, hemelytris pellucidis, apicem abdominis superantibus, extus leviter rotundatis. *Long.*, 3—3·8 *mm.; cum hemelytr.* 3·5—4·5 *mm.*

Caput fusco-nigrum, medio superne plus minusve late rufescens, subtus intra oculos utrinque macula basali oblonga subobliqua flava notatum, antennis testaceis, hic et illic plus minusve distincte infuscatis, bucculis pone medium sensim evanescentibus, basin capitis haud attingentibus, rostro coxas medias attingente, articulo primo bucculas superante, gulæ æquilongo. Pronotum antrorsum nonnihil angustatum, antice capite angustius, lateribus medio levissime subsinuatis, disco nigro, dimidio postico plus minusve pallide testaceo-variegato vel striato, interdum fere toto testaceo, nigropunctato, linea transversa subapicali nigra. Pectus nigrum, acetabulis testaceis, sæpe etiam margine antico et postico prosterno posticoque mesosterni, interdum imo maculis duabus lateralibus metasterni rufescentibus. Scutellum nigrum, interdum vittis duabus longitudinalibus rufescentibus summoque apice pallido. Hemelytra apicem abdominis longius superantia, extus fere a basi leviter rotundata, corio et clavo albidis, illo secundum venas plus minusve distincte minute seriatim fusco-maculato, margine postico fusco, bis flavido-interrupto, membrana lacteo-hyalina. Abdomen subtus subtiliter adpresse albido-pilosulum, nigrum, rarius medio flavido-variegatum, margine postico segmenti penultimi ventralis medio sæpe testaceo. Pedes testacei, plerumque nigropunctati, dimidio apicali femorum posticorum, tibiis basi et apice anguste, articulo tarsorum primo apice et ultimo toto infuscatis.

Belongs to the group *hh* of Stål.

The genus *Nysius* has a very marked insular habitat. The Hawaiian Islands especially are wonderfully rich in species of *Nysius*, not less than thirteen species having been described from these islands, chiefly by Dr. Buchanan White and the Rev. Th. Blackburn. From Buchanan White's excellent structural descriptions it is evident that these species cannot be regarded as varieties of a smaller number of species. Apart from the uncertain species of Walker, we find the following number of species for the other insular faunas:—New Zealand has three species, the Society Islands two, the Galapagos Islands one, the Ladrone Islands one, Japan two, Ceylon and Sumatra one, St. Helena two, Madeira and the Canary Islands one, the Azores one, Jamaica three. The palæarctic region (exclusive of the Atlantic Islands) has thirteen species, the Ethiopian region four, North America five, and the American continent south of Texas twelve species. In tropical Asia (exclusive of Ceylon and the Sunda islands) the genus has not yet been met with. It is probable that most of the Pacific insular groups have their peculiar species of this genus, but we still know practically nothing of the Hemipterous fauna of many of these islands. *Nysius thymi*, Wolff, has the widest geographical range, being distributed through Europe and Siberia, and over a great part of the United States and British America; according to Buchanan White it also occurs in St. Helena.

I take this opportunity of correcting the synonymy of a species of *Nysius*. *N. zealandicus*, Dall., must retain its older name, *clavicornis*, Fabr. Stål was wrong in citing "*Lygæus clavicornis*, Fabr., Ent. Syst., iv, 169, *ex parte*." The description of Fabricius, *loco citato*, *exclusively* refers to the New Zealand species.

Forssa, Finland:
January 8th, 1891.

ON TWO NEW SPECIES OF *HETEROMERA* FROM JAPAN.

BY G. LEWIS, F.L.S.

I have in preparation a paper on the Japanese *Heteromera*, which comprises about *eighty* species, but as there will be some delay in its publication, I have decided to print in advance a note on two species, of which I have distributed specimens with manuscript names.

Amarantha, Motschulsky, Etud. Ent., viii, p. 141, 1859; = *Chariotheca*, Pascoe, Journ. Ent., i, p. 125, 1860; = *Metaclisa*, Duval, Gen. Col., iii, p. 296, t. 72, f. 359, 1861.

AMARANTHA ATROCYANEA, *n. sp.*

Oblonga, subparallela, nitida, supra atro-cyanea, corpore infra, antennis pedibusque piceis. *Long.*, 9—9½ *millim.*

Oblong, subparallel, shining, blackish-blue above, under-surface more or less piceous, sometimes with a bluish tinge; antennæ and legs piceous or blue-black. Head somewhat thickly punctured, the punctures between the eyes being rather coarse and a little confluent in front; thorax evenly and less densely punctate, widest at posterior angles, narrowest at anterior angles, lateral margins narrowly but clearly elevated, and continuing as a stria behind the eyes, and becoming evanescent in the centre, base sinuate on each side; scutellum triangular and impunctate; elytra: sutural stria very short and consisting of six or eight punctures, eight other punctate striæ, with the interstices smooth and slightly convex. The colour of the under-surface and legs varies.

Motschulsky formed the genus *Amarantha* to receive a species (*viridis*) taken on the borders of the Caspian Sea, south of the Caucasus, but he placed it near *Helops*. Faust, Hor. Ent. Ross., xi, p. 249, places it in its proper position near *Hoplocephala* and *Platydema*.

I found examples of this species in all the elevated forests as far north as Nikko, and in the Yezo it was taken at the sea-level. It inhabits the touch-wood of decaying beeches.

Basanus, Lacordaire, Gen. Col., v, 1859, p. 306.

BASANUS EROTYLOIDES, *n. sp.*

Oblongo-ovalis, niger, nitidus; elytris utrinque maculis vel fasciis rufis duabus; abdomine rufo, apice parum infuscato; pedibus nigris.

Long., 7½—10 *millim.*

Head rather coarsely and roughly punctate, with a shallow impression between the eyes; thorax punctured, punctures rather smaller and less rough, the lateral margins well raised, forming an even but narrow sulcus within; elytra with corresponding epipleuræ, which, however, terminate at the apical red spot: striæ are formed of small punctures in well-defined rows, interstices flat, with finer scattered punctures; the subhumeral transverse fascia does not cross the epipleura, and internally it ceases before the sutural stria—between the 4th and 5th stria it has a long denticulation, which nearly touches the base of the elytra, and posteriorly the margin of this fascia has three denticulations, shorter and equal to each other in length, before the apex of the elytra there is a second red spot of irregular, but not always constant, outline. Beneath the abdomen is a bright red, with the terminal segment infuscate. Antennæ and legs black, with the tarsi piceous.

One example in twenty has faint longitudinal impressions on the elytra.

This fine species differs from *B. forticornis*, Dej., in having longer and more slender antennæ, the thorax narrowed anteriorly from the middle, the elytra usually without longitudinal impressions and the anterior fascia dentate, and the abdomen red.

The genus should be placed next to *Scaphidema*; the structure of the sterna is similar in both.

Found in old trees in all the islands. Yuyama, Hakone, Nikko, and Sapporo are special localities for it.

Folkestone: *February*, 1891.

CRYPTOHYPNUS DERMESTOIDES AND ITS ALLIES.

BY G. H. HORN, M.D.

Cryptohypnus dermestoides, Herbst, *C. quadriguttatus*, Lap., and the closely allied North American species form a little group, of which *C. dermestoides* may be taken as the type. They all have a peculiar sculpture of the thorax, rough in part, smooth behind. The species may be distinguished thus:—

Prosternal sutures single, not grooved nor smooth.
  Elytra without spots; ventral segments, ♂ ♀, simple .... *gradarius.*
  Elytra with four faint spots; second ventral segment, ♀, with a pubescent spot .... *dispersus.*
Prosternal sutures double, grooved and smooth.
  First ventral segment with a small tubercle between the coxæ, and the anterior tibiæ dilated, in the male .... *quadriguttatus.*
  First ventral segment with a small tubercle on a flat space, and the anterior tibiæ simple, in the male .... *Melsheimeri.*
  First ventral segment convex between the coxæ and fimbriate posteriorly, and the anterior tibiæ dilated, in the male .... *dermestoides.*
  First and second ventral segments each with a tubercle, and the anterior tibiæ simple, in the male .... *concinnus.*

The first ventral segment of *C. dermestoides* (♂) is somewhat gibbous between the coxæ and raised to a level with them, and the fimbriæ are directed backwards; while in *C. quadriguttatus* (♂) the first ventral segment is rather flat between the coxæ, and has a round pubescent spot. I am only acquainted with two species (both North American) with the prosternal sutures single, not grooved nor smooth; but I suspect that there are parallel forms in Europe, and that there are one or two good species at present considered varieties of *C. dermestoides*, with plain prosternal sutures. It is curious that in the first series (prosternal sutures simple) the abdomen of the male is simple, while in one of the species the female has a pubescent spot on the second ventral segment. In two of our species with non-striate elytra, *C. pectoralis* and *C. obliquatulus*, the male has at the middle of the prosternum a small round spot with erect pubescence. In none of our *Cryptohypni* is the male front tibia dilated, as it is in the European *C. quadriguttatus* and *C. dermestoides*. I am indebted to Mr. Champion for examples of these last mentioned species for examination.

Philadelphia: *January* 5*th*, 1891.

[*C. dermestoides*, Herbst, and *C. quadriguttatus*, Lap. (= *tetragraphus*, Germ.), considered by most recent authors as varieties of one species, thus prove to be distinct. They occur together in various northern localities in Britain, as Rannoch, Braemar, Scarborough, &c.; in Scotland, *C. dermestoides* is, perhaps, the commoner of the two, while at Scarborough, *C. quadriguttatus* is much more abundant than *C. dermestoides.* A large number of specimens collected by Mr. J. J. Walker in Italy, at Civita Vecchia, all belong to *C. quadriguttatus*, none of these showing the slightest variation in the elytral spots. It may be safely assumed that all British specimens with *distinct* spots are *quadriguttatus*; while those which are unspotted or merely have the shoulders and an indeterminate patch near the apex of each elytron a little lighter are, with rare exceptions, *dermestoides.* In some examples of *C quadriguttatus* the basal or the apical spot is obsolete. Many of the Scarborough specimens of *C. quadriguttatus* have the spots large and sharply defined, these examples resembling the normal continental form; Scotch examples are rarely so well marked. The two insects are treated as distinct by Candèze, who, however, did not observe the conspicuous male characters to be found in the front tibiæ (noted by Thomson) and on the first ventral segment; the chief characters used by him being colour, and an imaginary difference in the length of the elytra.—G. C. C.]

DESCRIPTION OF THE LARVA OF *HYPENA ROSTRALIS.*

BY GEO. T. PORRITT, F.L.S.

My first acquaintance with the larva of *Hypena rostralis* was made at Deal at the end of August, 1888, when I found a full-fed specimen wandering about near some hop plants in a garden, and evidently searching for a suitable place in which to spin up. I placed it in a cage in which were other species, and saw no more of it until the imago appeared in the month following. On the 24th of June last I next saw larvæ through the kindness of Mr. W. R. Jeffrey, of Ashford, who sent me two from a few he had reared from eggs deposited by a captured ♀. The ♀ moth, as is well known, hibernates, and deposits her eggs in spring or early summer; but whether the ♂ also hibernates and pairing is effected in the spring, or this takes place in the autumn, I cannot say. Mr. Jeffrey tells me the eggs from his moth were deposited about the 15th of May, and hatched on the 26th of the same month; the larger of the larvæ received was nearly full-grown, so next day I described it as follows:—

Length about an inch, and slender proportionately; the head has the lobes rounded, is the same width as the second, but narrower than the third segment. Body cylindrical, widest in the middle, attenuated very gradually to the anal extremity. There are only four pairs of posterior legs, on the 8th, 9th, 10th and 13th segments respectively, so that the larva, when walking, arches the 5th, 6th and 7th segments; skin soft and smooth; tubercles slightly raised, and from each of them springs a single short and inconspicuous hair.

Ground-colour bright grass-green, exactly of the same colour, indeed, as the under-side of the hop leaves on which it feeds; the head tinged with yellow. A darker green pulsating vessel showing clearly through the skin forms the dorsal line; subdorsal lines clear white; spiracular lines also white, but much interrupted and less distinct; tubercles and spiracles black, and the head is also numerously dotted with black; segmental divisions yellow, but scarcely noticeable, the hairs grey.

Ventral surface, legs and prolegs uniformly of the same bright green of the ground of the dorsal area. Feeds on hop, and when young (Mr. Jeffrey says) is very inconspicuous, if at rest in its usual position along the midrib of the hop leaf, the colour of the leaf and larva so closely resembling each other.

Next day, on the 26th, the larva described became paler in colour and began to spin its cocoon, which, on the following day, was evidently nearly completed; during the spinning a pretty pink colour spread over the dorsal area of the larva. The cocoon is of white silk, but so slender, that the pupa can be distinctly seen through it. The pupa is about five-eighths of an inch long, and very much of the ordinary *Noctua* shape; it is smooth and polished, the ribbed antennæ cases prominent and reaching to quite the bottom of the wing sheaths; colour rich mahogany-brown.

When full-fed both larvæ seemed exactly alike, and the first moth emerged on July 21st, the second on July 26th.

Huddersfield: *February 14th*, 1891.

Sphinx pinastri as a British Insect.—We take the following from Mr. Bloomfield's "Lepidoptera of Suffolk," as of interest, because it concerns probably the only corner in these islands in which this common and destructive continental insect has any claim to be considered indigenous:—"Very local. Tuddenham St. Martin in 1877, Waldringfield, two specimens in 1878, and one in 1879, Saxmundham in 1879, Ipswich in 1881 and 1882. Mr. N. F. Hele writes from Aldborough: 'in July, 1881, a specimen was taken in the Vicarage grounds here, on the wing, in the vicinity of some honeysuckle. During the months of July and August in the following year we captured about forty specimens in this neighbourhood. We found them at rest on the trunks of Scotch firs from four to about fourteen feet from the ground, in every respect apparently without regard to wind or weather.' Until the last two years Mr. Hele has not failed to take a specimen or two every year."—Eds.

Plusia moneta, F., in France.—At a meeting of the French Entomological Society on December 10th, 1890, the veteran Lepidopterist, Mons. J. Fallou, announced (Bull. Soc. Ent. Fr, 1890, pp. ccxi) that he had captured a specimen of this insect at Champrosay (Seine et Oise), not far from Paris, in June, 1890, the first time during the twenty years he has resided there. He also gave some general notes on its occurrence in France, commencing with Duponchel (vol. vii, 2, p. 63, 1829), who stated that it had then only been found in Normandy. Subsequently it had been noticed at Mont Dore (Auvergne) in 1879; in Alsace; and, according to M. Jourdheuille, at Troyes (Aube) in 1887 and 1888. M. Fallou does not allude to the "France méridionale" given by Guenée in his "Noctuélites" (ii, p. 332, 1852).

We call attention to Duponchel's statement as to its occurrence in Normandy previous to 1829 as of especial interest at the present time. Duponchel says that a brother of M. Boisduval found it regularly at Falaise every year, that it was double brooded, and that the larvæ fed on a variety of plants, including sunflower and Jerusalem artichoke, burdock and cucumber. Guenée (*l. c.*) briefly alludes to the same subject. According to this statement, by eminent Lepidopterists, its first appearance in the North of France is by no means recent, and, in fact, its first recorded occurrence in the country was in the north. Does it still occur in Normandy?—Eds.

Acidalia immorata.—In the 24th vol. of the Ent. Mo. Mag., p. 133, is recorded the capture of this insect, as follows:—"On June 27th last (1887) Mr. C. H. Morris of this town showed me an insect of which he had just caught two specimens . . . the insect somewhat resembled *Fidonia atomaria* . . . subsequent examination of the specimens showed clearly it was not that species, and that it *was evidently new to the British list.*" It may interest your readers to learn that the statement underlined is incorrect. On referring to Proc. Ent. Soc. of London, 1868, p. xxxviii, they will find these words:—"Mr. S. Stevens exhibited a specimen of *Chœrocampa celerio* . . . also a moth, from the British collection of the late Mr. Desvignes, ticketted '*immoraria*, Hüb.,' which it was suggested was an extraordinary variety of *Strenia clathraria.*" Thus the insect had been recorded twenty years or so earlier.—J. Greene, Rostrevor, Clifton, Bristol: *February* 12*th*, 1891.

[We prefer to put the matter this way:—The late Mr. Desvignes appeared to have correctly named his specimen; but it seems strange he nowhere published (so far as we know) any statement about it. Subsequently, after his death, it was erroneously considered a variety of *S. clathraria,* and thus it rested down to 1887. See also Ent. Mo. Mag., vol. xxiv, p. 163, and Proc. Ent. Soc., 1887, p. xlix.—Eds.].

Coleoptera and Lepidoptera at Bundoran, Ireland.—On July 14th, 1890, Mrs. Johnson and I started for Bundoran, where we arrived after a tedious journey, the latter part of which was relieved by the scenery as we passed along the shores of Lough Erne, or crossed the river Erne, or viewed the mountains of Leitrim and Sligo. Bundoran itself is of the usual type of small Irish towns: a long, straggling street, with here and there an offshoot to right or left; it lies on the southern side of Donegal Bay, with the sea in front and the mountains rising in the background at a distance of some three or four miles; north-west lies the mouth of the Erne, and between it and Bundoran are extensive sand-hills, covered with *Ammophila,* wild pansies, ragweed, and yellow bedstraw (*Galium verum*), with a few patches of dwarf roses (*Rosa spinosissima*); this formed our chief hunting-ground. We twice made excursions towards the mountains, but found the sand-hills much the best ground.

I had never been on the west coast of Ireland before, and was in great hopes of turning up something good, but in this I was disappointed, partly from the unfavourable season, and partly from the short time I had to spend, as I returned home for Sunday, 20th, and left altogether on the 26th, so that I had only a few days for collecting; I should mention that I spent two days near Belleek, of pottery fame, at Templenew, where the hunting-ground lay in old woods of hazel and holly, stretching along the banks of the Erne, the home of the badger, a very promising locality, but as I had only a few hours I did not do much, especially as the second day was spoiled by rain.

I had hoped to get some good varieties of *Agrotis* on the sand-hills, but I was totally at fault, as I did not see a single specimen; in fact, the *Lepidoptera* were few and far between, owing, I imagine, to the dampness of the season, for previous to my arrival, I was told there had been continuous wet weather for some time. The butterflies comprised *Pieris brassicæ*, *P. rapæ*, and *P. napi*, *Epinephele Janira*, and *Lycæna Icarus*, this last was large and fine, but not plentiful. I took on the sand-hills a ♀ of *E. Janira*, with the blotches on the anterior-wings large and nearly white, giving it when on the wing the appearance of *Satyrus Semele*, for which I at first mistook it. The *Noctuæ* were represented by *Triphæna pronuba*, *Xylophasia monoglypha (polyodon)*, and *Mamestra furva*. The first two were taken at sugared heads of ragweed, the last (a single specimen) flew into our sitting-room. *X. monoglypha* and *T. pronuba* were quite the ordinary forms, and not plentiful. A single specimen of *Eupithecia centaureata* came to sugared ragweed. These were all that were produced by night work, which was pleasantly varied by a visit from a keeper who wished to know whether we were ferretting rabbits.

By beating and kicking the tufts of *Ammophila* we took several *Melanippe sociata* (*subtristata*), of rather darker form than usual, also *Platyptila ochrodactyla* and *Mimæsoptilus pterodactylus*. The only thing that was really plentiful on the sand-hills was *Crambus perlellus*, which showed a good deal of variation. Inland we took *Lomaspilis marginata*, *Tortrix icterana*, *Sericoris cespitana*, *S. lacunana*, *Halonota trigeminana*, *Catoptria Scopoliana*, and *Elachista cygnipenella*, these were taken by beating hedges and among sallows in marshy ground.

At Templenew our captures were not numerous nor exciting: one *Eupithecia tenuiata* beaten out of a sallow bush; one *Tanagra atrata*, in the wood; *Rivula sericealis*, abundant and dark; *Scopula lutealis*, *Crambus culmellus*, *Sericoris lacunana*, *Bactra lanceolana*, *Catoptria Scopoliana*, and *Grapholitha nigromaculana*, in meadows and among *Iris pseudacorus*, or "flaggons," as the country people call them. I am indebted to Mr. Barrett for kindly looking over and determining for me those species about which I was doubtful.

Of *Coleoptera* I managed to take a much larger number than of *Lepidoptera*, partly owing, I dare say, to my better acquaintance with them, and partly to their being less affected by the damp. At Belleek (Templenew), the Erne seems more productive of salmon than *Hydradephaga*, for I could only get a solitary specimen of *Hydroporus erythrocephalus*. Under stones I got *Leistus rufescens* and *Pterostichus vulgaris*; on *Iris pseudacorus* were *Donacia sericea* and *Aphthona cærulea*; and by sweeping herbage I took *Telephorus fulvus* and *T. flavilabris*.

Bundoran produced a much richer harvest. On the sand-hills *Notiophilus aquaticus*, *Clivina fossor*, *Broscus cephalotes*, *Harpalus ruficornis*, *Calathus melanocephalus*, and *C. micropterus* were found under stones and at roots of grass, &c. *Cercyon melanocephalus*, *C. flavipes*, *C. hæmorrhoidalis*, *C. depressus*, *C. terminatus*, *Aphodius rufescens*, *A. rufipes*, and *A. depressus*, in *stercore bovino*, under which I searched carefully for *Geotrupes*, but failed to get anything but *G. stercorarius*, L. One morning, as I climbed to the top of one of the sand-hills, a couple of crows rose reluctantly from some object in the valley beneath; I descended in the hasty and undignified manner rendered necessary by the steepness of the slope, and found a nice young rabbit, in prime condition for attracting carrion-loving beetles; I visited it every day till my departure with very satisfactory results, taking the following: *Necrophorus ruspator* (*humator* did not appear, though common on Antrim coast), *Silpha rugosa*, *Creophilus maxillosus*, *Ocypus cupreus*, *Xantholinus punctulatus*, *X. linearis*, *Philonthus succicola*, Thoms. (*proximus*, Kr.), *Ph. sanguinolentus*, *Ph. longicornis*, *Ph. varians*, *Ph. marginatus* (also very common in *stercore*), *Aleochara fuscipes*, *Tachinus marginellus*, *T. laticollis*, *Choleva morio*, *C. cisteloides*, *Saprinus nitidulus*, and *S. æneus*, this last was very numerous. *Serica brunnea* was abundant, crawling about the sand and herbage, or lying dead in the hollows. *Ægialia arenaria* and *Otiorhynchus atroapterus* occurred crawling on the sides of sand-hills, always choosing the steepest and barest places; sweeping ragweed produced *Longitarsus* (*Thyamis*) *gracilis*, *L. jacobææ*, Wat. (*tabidus*, Ol.), very plentiful, *L. lævis*, and *Coccinella* 11-*punctata*; on thistles I took *Sphæroderma cardui* and *S. testaceum*, and by general sweeping, *Meligethes viduatus*, *M. æneus*, *Brachypterus pubescens*, *Adrastus limbatus*, *Agriotes obscurus*, *Apion fagi*, *A. carduorum*, *A. ervi*, *A. loti*, *Ceuthorhynchus pollinarius*, *Ceuthorhynchideus troglodytes*, and *Cneorhinus geminatus*. Inland I took in a boggy pond *Haliplus obliquus*, *Hydroporus vittula*, *H. tristis*, *Helophorus aquaticus*, *H. æneipennis*, *Anacæna globulus*, Payk, and *Limnebius papposus*. In the river Drowes, or Bundrowes, as they call it at Bundoran, I got some *Limnius tuberculatus*, and by beating sallows, *Crepidodera ventralis*, *C. helxines*, *C. transversa*, and *Dorytomus maculatus*. I have given a very extended list of my captures as the locality was apparently unworked previously. No doubt, with a more favourable season, and a longer time to work, a much longer and more interesting list could be obtained.—W. F. Johnson, Winder Terrace, Armagh: *Nov. 6th*, 1890.

Hydroporus septentrionalis and other Coleoptera in the Plymouth district.—On September 9th, 1890, one specimen of *H. septentrionalis* was obtained in a pool beside the river Plym, near Plymouth. Although frequent search was made no further examples were discovered. In the spring of 1890 *Deronectes latus* was caught in some pebbly pools in the same locality, and *Scydmænus nanus* was shaken out of rubbish at the foot of an oak near at hand. One specimen of *Panagæus* 4-*pustulatus* under stone on slope near the sea, a couple of *Oxytelus maritimus* and *Lymnæum nigropiceum*, *Phytosus balticus*, and *Sipalia testacea* were captured accidentally on the seashore. The first specimen of *Lymnæum* was taken accidentally whilst watching the sand-hoppers, &c., compelled to beat a hasty retreat from their labours on the decaying seaweed and other rejectamenta on the seashore as the sea advanced a few minutes before high water on the *spring* tide; search being made afterwards at low water, the head quarters of the insect was traced out, and several specimens secured. Entomologists at the seaside might find it worth while to visit suitable localities on the occasions mentioned; and, even though no rare capture should be made, they would, nevertheless, find that the remarkable spectacle of a countless army of sand-hoppers and other crustacea, with a greater or less sprinkling of beetles, flies, spiders, &c., all with their heads in the same direction, and all probably actuated by the same motive of self-preservation, fleeing from the advancing waves, would well repay them for the time and trouble the sight may cost. I have been surrounded by such great numbers of these little crustaceans, that it has been impossible to get out of their midst without regretfully crushing them at every step. In the autumn a small colony of *Diphyllus lunatus* (larva, pupa and imago) was found in black, globular, fungoid growths on oak, and *Ocypus brunnipes* was taken beneath moss on the same species of tree. In the previous spring (1889) in a willow bed a single specimen of *Pterostichus æthiops* was captured.—James H. Keys, 9, Addison Road, Sherwell Estate, Plymouth : *February*, 1891.

A query as to the food of certain Dipterous larvæ found in nests of Vespidæ.—I feel that I can say very little in reply to this interesting question raised by Mr. Meade (*ante* p. 43), simply because so much mystery seems bound up in "wasp paper" as to prevent a trustworthy investigation. In a state of confinement all the Dipterous larvæ recorded (*ante* p. 41) fed upon wasp larvæ and pupæ, preferably those that were in a state of decay. Failing these they readily fed upon the material at the base of the cells, which, I believe, consists of cast skins, &c. In no instance have I found any of the larvæ inside a sealed cell ; neither have I ever seen them attack and kill either larvæ or pupæ. It is just possible, however, that *H. canicularis*, L., may feed upon living larvæ and pupæ ; indeed, I do not see how they could derive sufficient nourishment from the excrement or the few dead larvæ and pupæ, especially in nests where these larvæ occur in great numbers as I have seen them do. I once took a nest of *Bombus muscorum*, Linn., which was almost alive with the larvæ of *H. canicularis*, as many as three or four in a single cell. They seemed to have eaten everything contained in the nest, even the cells were destroyed by them. This nest contained but few larvæ of the *Bombus*, which is not to be wondered at, for in addition to *Homalomya*, there were quantities of *Cryptophagi*.—R. Newstead, Grosvenor Museum, Chester : *February 5th*, 1891.

Scarcity of Aculeate Hymenoptera in South Devon.—I have been much interested and, I fear, also a little pleased to find in your columns several references to the scarcity of insect life on the coast of Devon. I have, for the last three years, visited South Devon, and collected on the coast line from Paignton and Torquay to Teignmouth and Dawlish, and inland as far as Dartmoor, but, as regards the Aculeate *Hymenoptera*, never have I worked so poor a ground. The vegetation is luxuriant and varied, the climate—at least, from an Anglo-Indian point of view—absolutely perfect, but bees, wasps and ants are not only extremely limited in species but in numbers. There is a spot beyond Dawlish called the "Warren," with the most attractive sandhills, a very Paradise for the Fossores, but not a sand-wasp could I find ; I have seen better collecting in St. Sepulchre's little garden in the city.

The first visit I attributed my want of success to having been accustomed for so many years to collecting in India, and after the grand tropical forms I thought it very possible that our less conspicuous English species might have escaped my notice ; but two more visits, coupled with the observations of Mr. S. Stevens and others, lead me to think it is not from personal defects as a collector, but really that there *is* something in the county itself which is not suitable or attractive to *Hy-*

menoptera. The only rarity captured from 1888 to 1890 was a ♀ of *Stenamma Westwoodii* at Labrador Shaldon. The only feature of sand-wasp life found was one quite refreshing little colony of *Mellinus arvensis* in a small sandpit on Haldon Heath, Teignmouth. — G. A. JAMES ROTHNEY, 15, Versailles Road, Anerley: *January 24th*, 1891.

Aculeate Hymenoptera in Wiltshire in 1890.—The season of 1890 seems to have been a very poor one generally for the *Aculeata.* Many of the very commonest species were either totally absent or appeared only in very limited numbers; on the other hand, a few species, as usual, appeared in unprecedented abundance.

The most striking feature of the season, however, was the early appearance of certain *Andrenidæ*, [not the earliest spring species, but those which normally come out from the middle to the end of May. *Andrena Wilkella*, Kirb., *A. angustior*, Kirb., and *A. nana*, Kirb., were all to be found in both sexes at the end of April, and it was curious to notice these species flying about with equally fresh specimens of either sex of the very early *Andrenæ: Gwynana*, Kirb, *minutula*, Kirb., *Trimmerana*, Kirb., &c.

Halicti were exceedingly scarce, and it will probably take several seasons to bring them to their former abundance, as their numbers have steadily decreased during the past three seasons. Previously to 1887 there was a steady increase in their numbers; in that year they literally swarmed; the same remarks apply to *Sphecodes*, both as to the increase and decrease of their numbers. The following species are worthy of mention, either for their rarity, or for their unusual scarcity or abundance during the past season.

Andrena lapponica, Zett.—I was fortunate in taking a few specimens of this scarce or overlooked species on March 15th. One only was a ♂, this sex being evidently already past: it must be a very early species. These specimens were taken from a few burrows in a hard sandy path. *A. angustior*, Kirb.--Male specimens generally distributed in North Wilts and adjoining parts of Gloucestershire. The females are much scarcer. It is altogether a very unobtrusive species, and in all probability common generally. A good plan to catch this and other species, which fly up and down a hedge bank without settling, is to place on the ground small pieces of paper or light coloured stones: the bees readily alight on these for the purpose of sunning themselves. *A. Wilkella*, Kirb., *nec* E. Saund. (Synopsis).—Exceedingly abundant from the end of April to June. The males of this species were to be seen for a fortnight in May flying round the foliage of an isolated sunny bush in such myriads as to resemble a vast swarm of hive bees about to settle. The *Andrenidæ* are said to be characterized by their silent flight, but a deep hum could be heard at a considerable distance from the bush. Elsewhere the species was in thousands flying up and down the hedge-rows. In my notes on this and the allied species in this Magazine (this species I there called *xanthura*), I expressed doubts as to whether stylopized specimens of this species existed. I have now taken a number so affected, and think that most, if not all, of the specimens called *convexiuscula* belong to this species rather than to *Afzeliella*, but the matter requires further investigation.

Nomada bifida, Thoms.—Both sexes taken, and identically coloured specimens of *ruficornis* amongst them. *N. ochrostoma*, Kirb.—Very abundant. I easily captured fifty specimens in an hour or two; several times three or four specimens at a sweep. In my experience it is exclusively the parasite of *A. Wilkella*, Kirb., though said also to attack *A. labialis*, Kirb. *N. Fabriciana*, Linn.—Unusually common. This species is parasitic on at least two species, *A. Gwynana* and *Halictus rubicundus*, Chr. The specimens taken by me last season were attacking the former; and occurred from the 1st till the end of May. When parasitic on the *Halictus*, they appear at the end of May and continue till the middle of July. At the end of July, and in August, the specimens parasitic on *Gwynana* sometimes produce a second brood. This species may, therefore, be met with almost throughout the entire season. *N. flavoguttata*, Kirb.—Unusually scarce; the small *Halicti*, which it attacks, were hardly seen either in spring or autumn.

Osmia bicolor, Schk.—Less common than usual. *O. pilicornis*, Sm.—I took a short series of this species (♂ ♀). It burrows in dead wood.

Stelis phæoptera, Kirb.—One ♀; another seen.

Bombus cognatus, Stph.—Unusually scarce. *B. Latreillellus*, Kirb.—One ♀, and a few ☿. *B. sylvarum*, Linn.—All the nests I have found of this species have been built underground, though it is often stated to build on the surface. *B. Derhamellus*, Kirb., and *B. lapidarius*, Linn.—The former always builds a nest on the surface of the ground, the latter always below. *Volucella bombylans*, the parasitic fly, I feel sure, must attack the former, since the nest is placed in exactly similar situations to that of *B. muscorum*, Linn., from which the parasite has been bred. Nevertheless, it is generally stated to attack and mimic *B. lapidarius*, which is probably a mistake.

The common species of *Vespidæ* were very abundant. *Odyneridæ* mostly scarce. *Ancistrocerus Antilope*, Panz., very abundant, however, and *A. callosus* in its usual numbers. The habits of this last species differ from any other of its section. The females hibernate and re-appear very early in the spring, like *Halicti*, *Bombi*, &c. It provisions its nest with green *Tortrix* larvæ of considerable size. From one burrow I took about a dozen of these; one of them pupated immediately, but died; the others were all packed with full-grown parasitic larvæ of *Ichneumonidæ*, which appeared in thousands in the winged state after three or four days. It is evident, therefore, that the larvæ of the wasp would have starved, as the eggs had not been hatched, when I took the store from her burrow.

Fossores were exceedingly scarce, and I saw nothing which I have not previously recorded. *Pompilus gibbus*, ♂, appeared on May 1st, an exceedingly early date for these localities.—R. C. L. PERKINS, Sopworth Rectory, Chippenham: *January*, 1891.

Obituary.

Edmond André, F.E.S.—The French publications announce the unexpected death of this well-known Hymenopterist. Established at Beaune (Côte d'Or) formerly as a wine merchant, he later started as an entomological bookseller and general Natural History Agent, on an extended scale. His published entomological notes, &c., were numerous; but his principal work was the "Species des Hymenoptères d'Europe et d'Algérie," commenced in 1879, and continued, with the aid of his brother and other Hymenopterists, until his death. The portion concerning the *Braconidæ* was supplied by the Rev. T. A. Marshall. It is to be hoped that this most important work will be continued. He became a Member of the Société Entomologique de France in 1879, and joined the Entomological Society of London in 1880. He was also a Member of the Berlin and Stettin Societies.

Reviews.

THE LEPIDOPTERA OF SUFFOLK, compiled by E. N. BLOOMFIELD, M.A., F.E.S.; 60 pp., 8vo. London: Wesley and Son; Colchester: W. H. Harwood. 1890.

Another addition to the already numerous county Lists of British *Lepidoptera*. As is well known, the Rev. Mr. Bloomfield is not a resident in the county, but his connection therewith otherwise has enabled him to draw up a very valuable and useful List, and no pains seem to have been spared in order to render it complete. Such a List was indeed commenced so long ago as 1857 to 1859, in Morris's "Naturalist," by such well-known workers as the Rev. Joseph Greene, the Rev. H. Harpur Crewe, and Mr. C. R. Bree, but it extended only to near the end of the *Noctuæ*. This has been made use of in the present List, with many additions, both in species and localities, and the remainder has been completed; the *Micro-Lepidoptera* being especially well enumerated, and the whole could scarcely have been more detailed had it been the work of a resident, all the leading local observers having assisted him to their utmost. The physical features of the county are tolerably well known to all; the fact that it shares with Norfolk what is commonly termed the "breck-sand" district adds not immaterially to the number and interest of the species. The only thing we can find fault with is the absence of a numerical summary.

THE DARWINIAN THEORY OF THE ORIGIN OF SPECIES: by FRANCIS P. PASCOE, F.L.S., &c.; small 8vo, pp. 130. London: Gurney and Jackson. 1890.

This little book, written by an uncomprising opponent of the theory of Natural Selection, shows evidence of an immense amount of reading, and the numerous quotations from various authors render it useful to the general reader, whatever may be his views on the theory itself. Mr. Pascoe considers that the old theory of Evolution is practically "unassailable. But Evolution is not Natural Selection." We think there are many who will agree with him; but Natural Selection may, nevertheless, be a potent factor in Evolution. Outside questions of theory altogether, the book may be profitably studied by those who wish to know something of the many wonderful adaptations of structure, habits, and metamorphoses in the Animal Kingdom.

SIXTH REPORT ON THE INJURIOUS AND OTHER INSECTS OF THE STATE OF NEW YORK; by J. A. LINTNER, Ph.D., State Entomologist. Albany, 1890.

As usual, Dr. Lintner produces an interesting and valuable Report, somewhat less bulky than its predecessors. It opens with a concise review of the principal features in Economic Entomology for the year, and the remainder consists of monographs of special insects in almost all Orders, worked out in a detailed manner. Several of them are well known as common both to Europe and N. America, amongst which we may mention *Hypoderma bovis*, *Adalia bipunctata*, *Dermestes lardarius*, *Aphis brassicæ*, &c. In any case these Reports are always useful to European workers in the same field, for if the subjects treated on be not always common to the two continents, there is usually much similarity.

GUIDES FOR SCIENCE-TEACHING; No. viii: INSECTA; by ALPHEUS HYATT and J. M. ARMS. Boston, U. S. A.: D. C. Heath & Co. 1890. Small 8vo.

This vol. of 300 pp., with copious outline illustrations, appears to be one of a series issued under the auspices of the Boston Society of Natural History. The joint authorship is explained in the introduction, Mr. Hyatt having secured the assistance of a lady, Miss Arms. We think it will serve the useful purpose for which it is intended, viz.: as a Guide to *teachers.* It is got up in the best style for such a work, and the subjects specially taken up as points for demonstration seem suitable. The arrangement followed is the ascending scale, and the classification is mainly that of Brauer. Possibly, a little too much prominence is given to "specialization," "development," &c. We take it that the theory of Evolution is specially upheld as opposed to Natural Selection in this Guide. The concluding passage is good: "Artificial ideas revenge themselves, and words become their ready instruments, first to express what is false, and then to help in binding the mind with the conservative fetters of habit."

Societies.

BIRMINGHAM ENTOMOLOGICAL SOCIETY: *January 19th*, 1891.—On this evening the First Annual Exhibition and Conversazione was held in the Library Hall of the Medical Institute, when over one hundred friends were present, and a most enjoyable evening spent. Among the exhibits may be mentioned the following: Mr. W. G. Blatch showed his collection of Midland *Coleoptera* in ten drawers, also drawers of *Heteroptera* and Aculeate *Hymenoptera.* Rev. C. F. Thornewill showed his collection of British Butterflies. Dr. P. B. Mason showed ten drawers of *Homoptera.* Mr. G. H. Kenrick, seven drawers of Butterflies collected by himself in S. America. Mr. G. T. Baker, ten drawers of Exotic Butterflies. Rev. E. J. Nurse, drawers of Fen and other British *Lepidoptera.* Mr. R. C. Bradley, his collection of *Tipulidæ,* in seven boxes, also *Tineina.* Other exhibits of *Lepidoptera,* &c., were shown by Messrs. G. W. Wynn, E. C. Tye, A. H. Martineau, G. W. Abbott, J. W. Neville, and Colbran J. Wainwright.

February 2nd, 1891.—ANNUAL MEETING.—Mr. W. G. BLATCH, F.E.S., President, in the Chair.

The Secretary presented the Annual Report, and the Treasurer the Financial Statement. They were both very satisfactory, the latter showing a balance in hand. Votes of thanks were passed to the Officers for their services during the past year, and the following were elected for the ensuing year: President, Mr. W. G. Blatch, F.E.S.; Vice-President, Rev. C. F. Thornewill, B.A., F.E.S.; Hon. Treasurer, Mr. R. C. Bradley; Hon. Secretary, Colbran J. Wainwright; Librarian, Mr. A. Johnson; Auditors, Messrs. H. Stone, F.L.S., and A. S. Wainwright; Messrs. P. W. Abbott and A. H. Martineau were elected as remaining members of the Council.—COLBRAN J. WAINWRIGHT, *Hon. Sec.*

The Society meets on the First and Third Mondays in the Month, at the Medical Institute, Birmingham, at 8 p.m.; all Entomologists will be welcomed. The Secretary will be glad to hear from gentlemen desirous of joining.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY: *January 22nd*, 1891.—W. H. TUGWELL, Esq., Vice-President, in the Chair.

Mr. J. C. Dacie, of Putney, was elected a Member.

Mr. South exhibited specimens of what he thought to be a new species of *Miana*;

the examples, which had been until lately in his cabinet as *M. strigilis*, Clerck, were taken with others in North Devon; Mr. South read notes relative to his exhibit. Mr. Tugwell remarked that an examination of a larger number of specimens would be necessary before coming to any conclusion as to whether those now shown were a new species, or only strongly divergent forms of *M. strigilis*. Mr. J. A. Clark, a variety of *Arctia Caia*, L., in which almost all the white colour of superior wings was replaced by the brown colour. Mr. Short, specimens of *Polyommatus Phlæas*, approaching the variety *Schmidtii*, Gerh. Mr. Tugwell, *Hepialus velleda*, Hb., from Paisley, showing considerable variation in colour and size; it was mentioned that this species occurred at Darenth Wood and Folkestone, Kent, and at Sutton and Boxhill, Surrey. Mr. Tutt, specimens of *Miana* received from Ireland, and which he contends are intermediate between *M. strigilis* and *M. fasciuncula*. In the discussion that followed Messrs. South, Tugwell, Adkin, Fenn, Hall, and others took part. Mr. Billups exhibited *Sericomyia borealis*, Fln., and the rarer species, *S. lappona*, L. *Chilosia œstracea*, L., *Arctophila mussitans*, F., *Eristalis intricarius*, L., and *Volucella bombylans*, L., with very dark varieties of the same, all taken in Aberdeenshire last season. A communication from the President was read by the Secretary.

The Treasurer submitted his balance sheet, showing a balance to the Society's credit of £71 17s. 9d.; the Secretary read the Council's Report for 1890, from which it appeared that 32 Members had been elected during the year, making a total membership of 232. The Election of Officers was next proceeded with, and resulted as follows:—Mr. W. H. Tugwell, President; Mr. J. Jenner Weir, F.L.S., &c., Vice-President; Mr. E. Step, Hon. Treasurer; Mr. W. West, Hon. Curator; Mr. D. J. Rice, Hon. Librarian; Mr. Barker and Mr. D. J. Rice, Hon. Secretaries; Messrs. R. Adkin, F.E.S., T. R. Billups, F.E.S., C. A. Briggs, F.E.S., J. T. Carrington, F.L.S., C. Fenn, F.E.S., R. South, F.E.S., and J. W. Tutt, F.E.S., Council.

The meeting closed with votes of thanks to the various Officers.

February 12th, 1891.—W. H. TUGWELL, Esq., President, in the Chair.

Mr. R. Adkin exhibited *Aplecta occulta*, L., bred during November and December last year from ova received from Forres in the previous August. The specimens were all of a light form, the pink shades in the primaries being strongly produced in many of them. Mr. Tugwell said there was a darker shade of colour in the specimens shown than in those obtained in the south. Mr. Tugwell exhibited *Melanippe hastata*, L., from Sussex and the Shetlands, to show the desirability of obtaining insects from various localities. Mr. Nussey, bred specimens of *Thecla pruni*, L., and called attention to a large specimen of the ♀ which had emerged from the pupa without antennæ. Mr. J. McLachlan, *Polia chi*, L., dark forms of *Noctua xanthographa*, Fb., *Agrotis lucernea*, L., and *Aporophyla nigra*, Haw., all taken at Aberdeen. Mr. Farrant, a richly coloured specimen of *Smerinthus tiliæ*, L., and an example of *Epinephele hyperanthus*, L., approaching the var. *Arete*, Müll. Mr. Auld, a coloured drawing of a pale variety of *Abraxas grossulariata*, L. Mr. Billups, *Trogus novæ caledonicæ*, Montrouz., *Enicodes Fichtelii*, Schr., and *Cicindelidæ*; also two species of *Hemiptera* from the same locality, *Tectocoris Banksii*, Don., and *Mictis symbolica*, Don.—H. W. BARKER, *Hon. Sec.*

Entomological Society of London: *February 4th*, 1891.—Frederick Du Cane Godman, Esq., M.A., F.R.S., President, in the Chair.

The President nominated the Rt. Hon. Lord Walsingham, M.A., F.R.S., Professor Raphael Meldola, F.R.S., and Dr. David Sharp, F.R.S., Vice-Presidents for the Session 1891—92.

Dr. Thomas A. Chapman, M.D., of "Firbank," Hereford; Mr. Horace St. John Donnisthorpe, of "Belvedere," Crystal Palace Park Road, S.E.; Mr. F. W. Frohawk, of 9, Dornton Road, Balham, S.E.; Mr. E. Ernest Green, of 10, Observatory Gardens, Kensington, W.; Mr. G. F. Hampson, B.A., of Thurnham Court, Maidstone; Mr. Frederick J. Hanbury, F.L.S., of 69, Clapton Common, Upper Clapton, N.E.; and the Hon. M. Cordelia E. Leigh, of Stoneleigh Abbey, Kenilworth, were elected Fellows of the Society.

Mr. C. J. Gahan called attention to a larva which he had exhibited at the meeting of the Society on the 1st October last, when some doubt was expressed as to its affinities. He said that Prof. Riley had since suggested that the larva was that of a Dipterous insect of the family *Blepharoceridæ*; he was quite of the same opinion, and thought it might probably be referred to *Hammatorrhina bella*, Löw, a species from Ceylon.

Mr. Tutt exhibited a long series of *Agrotis pyrophila*, taken last year by Mr. Reid, near Pitcaple, in Aberdeenshire, and remarked that this species had been commoner than usual last year in Scotland, the Isle of Portland, and the Isle of Man. He also exhibited long and variable series of *Melitæa Aurinia (Artemis)*, *Triphæna orbona*, *Abraxas grossulariata*, and *Melanippe fluctuata*, all from the same locality in Aberdeenshire.

The Rev. Canon Fowler exhibited a cocoon of *Deiopeia pulchella*, recently received from Lower Burmah.

Mr. C. O. Waterhouse exhibited specimens of *Scyphophorus interstitialis*, a Mexican species, and *Aceraius Comptoni*, a Ceylon species, recently taken by Mr. Bowring in his greenhouse. He also exhibited, on behalf of Miss Emily Sharpe, a specimen of *Daphnis hypothous*, Cramer, a native of Borneo, Java, and Ceylon, caught some years ago at Crieff, N.B. The specimen had long been confused with *Chœrocampa nerii*, under which name its capture was recorded in "The Entomologist," xiii, p. 162 (1880).

The Rev. Dr. Walker exhibited a collection, including many species of *Orthoptera* and Scorpions, recently received from Jerusalem.

Mr. Frederick Enock read an interesting paper, entitled, "The Life-History of the Hessian Fly." This paper was illustrated, by means of the oxy-hydrogen lantern, with a number of photographs of original drawings showing the fly in all its stages and transformations. Mr. G. H. Verrall said he believed the Hessian Fly was no more a recent introduction into this country than the Cabbage White Butterflies. The discussion was continued by Mr. Godman, Mr. Enock, and others.

Mr. Roland Trimen communicated a paper, entitled, "On some recent Additions to the List of South African Butterflies."

Mr. H. W. Bates communicated a paper, entitled, "Additions to the Carabideous Fauna of Mexico, with remarks on species previously recorded."

Mr. W. F. Kirby read a paper, entitled, "Notes on the genus *Xanthospilopteryx*, Wallgr."

Dr. D. Sharp contributed a paper, entitled, "On the Rhyncophorous *Coleoptera* of Japan," pt. 2.—H. Goss and W. W. Fowler, *Hon. Secretaries.*

ANNOTATED LIST OF BRITISH *TACHINIIDÆ.*

BY R. H. MEADE.

The British *Tachiniidæ* are very little known, comparatively few species having been properly identified, or described, in any English work; and the Family has excited little interest among British Dipterists. For the purpose of drawing attention to them, and to facilitate their study, I shall endeavour to arrange them into genera, and to name and briefly define as many species as I have been able to find or identify. The list, I fear, will be very imperfect, but it can be filled up by others. I shall only include those species which may be called true Tachinids, and are comprised in the sub-family of *Tachininæ* of Mr. Verrall's list.

These flies, which are parasitical upon other insects, especially upon *Lepidoptera*, belong to the most highly developed group of the *Muscidæ*, having strong wings, large scales (*alulets*), and often wide oval bodies.

The general characters of the family are the following:—The species are mostly armed with numerous strong spines and bristles. The eyes are more or less widely separated in both sexes, those of the male, however, being usually nearer together than those of the female. The frontal space (*frontalia*) is bordered with strong bristles (*fronto-orbital*), which are generally arranged in a single row on each side in the males, and in a double row in the females. The arista is mostly bare, with the basal half more or less thickened; it is composed of three joints, of which the first two are generally very short, and the third very long; but sometimes the second is more or less elongated, and becomes in some instances nearly or quite as long as the third. The antennæ vary much in length; the first joint is usually very short, the second is sometimes (in one genus only) longer than the third, occasionally of equal length with it, but generally much shorter. The sides of the *epistome* are usually furnished with long and strong vibrissæ, and the *facialia* (edges of the facial space containing the antennæ) are often ciliated for a longer or shorter part of their length. The cheeks (*wangen*, Sch., *mediana*, Dsv., the spaces between the facialia and the eyes) are sometimes clothed with soft hairs or bristles, and the chin (*backen*, Sch., *lateralia*, Dsv., the bottom of the face below the cheek and eyes) is also often ciliated. The back and sides of the thorax are furnished with rows of numerous spines, and the abdominal segments are also usually armed with strong setæ on their posterior edges, as well as in some species in the middle or disc. The legs are also provided with numerous spines, which are arranged in different manners. The wings have the first posterior cell more or less closely contracted and sometimes closed at the end, where it joins the costa, by the apical cross vein, which is formed by the bending upwards of the fourth longitudinal vein.

It is chiefly by variation in the above characters that the genera and species are distinguished from each other; and the formation of genera has been found so difficult, owing to the impossibility of deciding between generic and specific characters, that some authors have given up generic division of the Family altogether. This, however, has been found so inconvenient, that some artificial arrangement, with the adoption of generic names, is absolutely necessary. I have, therefore, drawn up an analytical table of genera, taking the characters from Macquart, Schiner, Rondani, and others, which I will insert before commencing the diagnosis of species.

TABLE OF GENERA.

1 (70) First posterior wing cell open at the end.*

2 (23) Arista with the second joint elongated.

3 (12) Arista straight; the second joint much shorter than the third.

4 (11) Antennæ with the second joint elongated.

5 (6) Antennæ with the second joint longer than the third .. 1. ECHINOMYIA, Dumér.

6 (5) Antennæ with the second joint shorter than the third.

7 (8) Palpi rudimentary.................................2. MICROPALPUS, Mcq.

8 (7) Palpi normal.

9 (10) Proboscis very long, straight, and slender ....3. APHRIA, Dsv.

10 (9) Proboscis rather long, but thick; fronto-orbital bristles in a double row in both sexes ....4. DEMOTICUS, Mcq.

11 (4) Antennæ with the second joint short.

12 (3) Arista geniculated; the second joint nearly or quite as long as the third.

13 (16) Head wide and swollen.

14 (15) Cheeks tumid, facial angle nearly straight..............5. GONIA, Mgn.

15 (14) Cheeks not tumid, facial angle inclined backwards...6. GERMARIA, Dsv.

16 (13) Head neither wide nor swollen.

17 (18) Proboscis long, slender, and twice elbowed ....7. SIPHONA, Mgn.

18 (17) Proboscis of the ordinary shape.

19 Wing-veins setigerous.

20 (21) Fourth longitudinal vein bent in a curve to form the apical cross vein; abdominal segments without discal setæ .....8. THRYPTOCERA, Mcq.

21 (20) Fourth longitudinal vein bent at an angle; abdominal segments with discal setæ ....9. BIGONICHETA, Rnd.

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* In some genera the aperture in certain species is very small, or even quite closed.

22 Apical cross vein deficient .... 10. Actia, Dsv.

23 (2) Arista with the second joint short.*

24 (65) Facial edges (*facialia*) unarmed, or ciliated only along their lower part.

25 (26) External (*discal*) cross vein extremely oblique ....11. Plagia, Mgn.

26 (25) External cross vein straight or only moderately oblique.

27 (46) Eyes hairy.

28 (43) Third joint of the antennæ not more than twice the length of the second, and often less.

29 (30) Colour bright gold-green ....12. Gymnocheta, Dsv.

30 (29) Colour generally black or grey.†

31 (34) Eyes of the male subcontiguous.

32 (33) Arista pubescent ....13. Macquartia, Dsv.

33 (32) Arista bare ....14. Polidea, Mcq.

34 (31) Eyes of the male more or less widely separated.

35 (40) Abdomen wide and oval.

36 (37) Eyes much shorter than the face ....15. Nemoræa, Dsv.

37 (36) Eyes prolonged to near the bottom of the face.

38 (39) Cheeks hairy; abdominal segments without discal setæ . 16. Chetoliga, Rnd.

39 (38) Cheeks bare; abdominal segments with setæ on the disc... 17. Nemorilla, Rnd.

40 (35) Abdomen oblong.

41 (42) Colour grey and red ....18. Olivieria, Dsv.

42 (41) Colour shining black without red.................. . 19. Zophomyia, Mcq.

43 (28) Third joint of the antennæ always twice (or more than twice) the length of the second.

44 (45) Third joint of antennæ very convex in front...20. Epicampocera, Mcq.

45 (44) Third joint of antennæ nearly straight in front......21. Exorista, Mgn.

46 (27) Eyes bare.

47 (58) Third joint of the antennæ not more (and often less) than twice the length of the second.

48 (49) Second joint of antennæ somewhat prolonged ....22. Tachina, F.

49 (48) Second joint of antennæ not prolonged.

50 (51) Forehead prominent; arista pubescent at the base, cheeks ciliated... 23. Brachycoma, Dsv.

51 (50) (52) Head wide and swollen, arista and cheeks bare... 24. Miltogramma, Mgn.

52 (51) Head neither wide nor swollen.

53 (54) Antennæ with the third joint short and round ....25. Trixa, Mgn.

54 (53) Antennæ with the third joint oblong.

55 (56) (57) Abdomen subglobose ....26. Clytia, Dsv.

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* In some species it is slightly prolonged, in others it can scarcely be distinguished from the first joint.

† In some species the colour may be metallic-blue or æneous, but never bright green

56(55)(57) Abdomen rather flattened ....27. MACRONYCHIA, Rnd.

57(55)(56) Abdomen slender and oblong ....28. MYOBIA, Dsv.

58 (47) Third joint of antennæ always more than twice the length of the second.

59 (60) Apical cross vein deficient ....29. RŒSELIA, Dsv.

60 (59) Apical cross vein present.

61 (62) Abdomen conical and mostly spotted ....30. MEIGENIA, Dsv.*

62(61)(63) Abdomen oval and not spotted ... .31. MASICERA, Mcq.

63(64)(61) Abdomen oblong and narrow, colour black ... 32. HYPOSTENA, Mgn.

64 (63) Colour ochraceous ....33. LESKIA, Dsv.

65 (24) Facialia ciliated along their whole, or nearly their whole, length.

66 (69) Eyes bare.

67 (68) Forehead glistening white .... 34. METOPIA, Mgn.

68 (67) Forehead not white ....35. FRONTINA, Mgn.

69 (66) Eyes hairy.

70 (1) First posterior wing-cell closed at (or before) the end (stalked or unstalked).

71 (74) Facialia ciliated.

72 (84) Eyes bare.

73 First posterior wing-cell closed at the end .....37. BAUMHAUERIA, Mgn.

74 (71) Facialia bare.

75 (76) First posterior wing-cell with a short stalk ....38. CLISTA, Mgn.

76 (75) Cell with a long stalk.

77 (78) Cheeks hairy .... 39. RHINOPHORA, Dsv.

78 (77) Cheeks bare.

79 (80) Antennæ with the third joint fully twice as long as the second...
40. SCOPOLIA, Dsv.

80 (79) Antennæ with the third joint only a little longer than the second.

81(82&83) The outer and inner cross veins near together ......41. PLESINA, Mgn.

82(81&83) The outer cross vein midway between the inner one and the angle of the fourth longitudinal vein ....42. LEUCOSTOMA, Mgn.

83(81&82) The outer cross vein nearer to the angle of the fourth longitudinal than to the inner cross vein ....43. PHYTO, Dsv.

84 (72) Eyes hairy.

85 (86) First posterior wing-cell with a very short stalk ...44. TRYPHERA, Mgn.

86 (85) Cell with a long stalk .... 45. LOEWIA, Egg.

1.—ECHINOMYIA, Duméril.

Servilia, pt., Dsv.
Fabricia, pt., Dsv.

Gen. ch.—Eyes bare; facialia unarmed; epistome prominent; antennæ long and drooping, with the third joint wide, and shorter than the narrow prolonged second joint; arista bare, with both the first and second joints somewhat elongated, the first being, however, much shorter than the second, which again is three or four times shorter than the third; body large, with a wide oval abdomen, furnished with numerous hairs and bristles; fore tarsi dilated in the female, in which sex the frontalia are wider than in the male, and have a double instead of a single row of *fronto-orbital* setæ on each side.

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* Some species in this genus have the eyes hairy.

1 (8) Abdomen armed with bristles, but not clothed with soft hair.
2 (7) Palpi filiform.
3 (4) Abdomen subglobose and black ....1. *grossa*, L.
4 (3) Abdomen oval and ferruginous.
5 (6) Antennæ rufous ....2. *fera*, L.
6 (5) Antennæ nigrescent ....3. *tessellata*, F.
7 (2) Palpi clavate (*fabricia*, Dsv.) .... 4. *ferox*, Pz.
8 (1) Abdomen clothed with soft hairs as well as armed with bristles (*servillia*, Desv.).
9 (10) Abdomen with the sides red .... 5. *lurida*, F.
10 (9) Abdomen with the sides not red .... 6. *ursina*, Mgn.

E. GROSSA, L.

This handsome fly, the largest of the British Muscids, has the thorax, abdomen and legs black. The face is yellow, and the cheeks, chin and all the back of the head are clothed with yellow hairs. The first and second joints of the antennæ are rufous, the third is black, rather small, and not quite half so long as the second. It is not common, and has been bred from cocoons of *Bombyx trifolii.*

E. FERA, L.

This species varies a good deal, but it is characterized by the thorax being black, with testaceous shoulders and sides; by the abdomen being yellow and pellucid, marked with a wide, longitudinal, dorsal black stripe; by the face being yellow, and the head clothed with yellow hairs; by the antennæ having the first two joints rufous, and the third black, which is about half the length of the second; by the legs (including the tarsi) being wholly yellow in the female, but having the basal halves of the femora black in the male. This is the most common species in the genus, and has been bred from the cocoons of several moths.

E TESSELLATA, F.

This species differs from *E. fera* by having the dorsal stripe on the abdomen narrower, and sometimes interrupted; by the thorax being grey rather than black, with the front and sides pale, and with indistinct dorsal stripes; by the face being white, and the hairs on the occiput, &c., pale yellow; by the legs being black or piceous; and the antennæ black or grey, with the second joint rufous at its extremity. The third joint is wide and large, and only about one-third shorter than the second. This species is rare.

E. FEROX, Panz.

This species is very similar in form and colour to the last. Its characteristic feature is the dilatation of the ends of the palpi, which are thick and clavate. The thorax and legs are black; the abdomen is rufous, with a wide sinuous (sometimes interrupted) dorsal black stripe, which is dilated, and covers the end of the last segment. The antennæ are black and rather short, the last joint being about two-thirds of the length of the second. This is also rare.

E. LURIDA, F.

In this and the following species the whole body is clothed with soft hairs, in addition to spines and bristles; the frontalia are also furnished with numerous soft hairs besides the ordinary bristles, which are weaker than usual, and very irregularly arranged; the hairs also extend down to the cheeks. In *E. lurida* the clothing on the abdomen is bright golden-yellow, beneath which the skin is black and shining; the sides of the abdomen are more or less widely marked with red. The antennæ have the first two joints piceous or testaceous, and the third (which is very little shorter than the second) black. The legs are testaceous, the femora being more or less nigrescent. This species is not common. I received one some years ago from Mr. Dale, captured, I believe, in Dorsetshire; it has been bred from the pupæ of *Cucullia verbasci.*

E. URSINA, Mgn.

This is larger than the former, being 6 lines (about 12 mm.) in length. It resembles *E. lurida* in general characters, but differs by having the abdomen almost entirely black, it being only slightly testaceous on the sides of the basal segments; the hairs on the abdomen are also less yellow, but whitish, and mixed with black; the cheeks have also more black hairs upon them than in *E. lurida*, in which they are mostly pale yellow, though mixed with black bristles; the antennæ also have the second joint rather longer than in *E. lurida.* This species is rare.

2.—MICROPALPUS, Mcq.

Gen. ch.—Body oblong; eyes hairy; antennæ drooping, with the second joint narrow, elongated, and generally only a little shorter than the third, which is widened and truncated at the end; arista with the second joint more or less elongated, but always four or five times shorter than the third; proboscis rather long and projecting, dilated at the end; palpi very small and short (quite rudimentary), and terminating in a little bristle; wings with a cubital appendix. The female has the frontalia wider than in the male, and armed with a double row of fronto-orbital bristles,* and also has the fore tarsal joints dilated as in the genus *Echinomyia.* The flies in this genus resemble those in the former one in their general habit, but are smaller and feebler in organization.

1 (2) Legs rufescent .... 1. *vulpinus*, Fln.
2 (1) Legs nigrescent.
3 (4) Chin bare .... 2 *fulgens*, Mgn.
4 (3) Chin hairy .... 3. *hæmorrhoidalis*, Fln.

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* As these bristles are usually in a single row in the male, and in a double row in the female, I shall only mention them again when they depart from this rule.

M. VULPINUS, Fln.

Thorax black, covered with white tomentum, and marked with four longitudinal black stripes; shoulders and sides yellow; scutellum yellow; abdomen rufous, with a wide longitudinal black dorsal stripe, which does not reach the apex, and with white tessellations, assuming the form of irregular broken transverse bands on the sides; cheeks bare; chin with a few soft hairs, but no bristles; legs testaceous, with the knees and tarsi nigrescent. Not rare; has been bred by Mr. F. Norgate from *Sphecia bembeciformis.*

M. FULGENS, Mgn.

This species differs from the former by having the chin quite bare; the legs nearly black; and the abdomen with the dorsal black stripe rather indistinct; so that it appears to be tessellated or variegated all over with red and white patches. Rare.

M. HÆMORRHOIDALIS, Fln.

This may be distinguished from both the other species by the chin being furnished with both hairs and bristles; by the antennæ having the second joint only half the length of the third; by the abdomen being black with red sides, and white tessellation, as well as having the anal segments red in both sexes; and by the legs being black, with the tibiæ partly testaceous. This species has not yet been recorded as British, but I possess one specimen which I obtained many years ago from the late Mr. F. Walker, with other British flies, and it is so common in Germany and Scandinavia that I think it may be safely recorded as indigenous.

3.—APHRIA, Desv.

Gen. ch.—Eyes bare; face rather oblique; facialia unarmed; antennæ drooping, second joint rather long, only a little shorter than the third joint in the male, and subequal with it in the female; arista with the second joint elongated, it being about one-fifth of the length of the third; proboscis long, narrow, pointed, and projecting horizontally forwards; fourth longitudinal vein bent upwards in a curve; third longitudinal vein setigerous.

A. LONGIROSTRIS, Mgn.

This (the only British species) is whitish-grey; the thorax is marked by four fine longitudinal black lines; the scutellum is grey; the abdomen is also cinereous, with the first segment black, and having a black band on the posterior edges of the other segments; the second and third and sometimes the base of the fourth rings are rufous on the sides; the frontalia and palpi are testaceous, the latter having black tips in the male, according to Macquart. This rare Tachinid is in Mr. C. W. Dale's collection.

4.—DEMOTICUS, Mcq.

Gen. ch.—Eyes bare; frontalia wide, and armed with a double row of orbito-frontal bristles in both sexes;* facialia unarmed; cheeks and chin bare; antennæ reaching the epistome, which is somewhat prominent; second antennal joint a little elongated, but two or three times shorter than the third; arista with the second joint more or less prolonged; wings with the veins setigerous.

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* This only applies to the first and typical species.

1 (2) Arista with the second joint a good deal elongated; third longitudinal vein armed with bristles at the base ....1. *plebejus*, Fln.

2 (1) Arista with the second joint very little prolonged; second, third, and fourth longitudinal veins all setigerous ....2. *frontatus*, Bohem.

D. PLEBEJUS, Fln.

Thorax light bluish-grey, with four indistinct black stripes, the central ones very narrow; scutellum grey; abdomen cinereous, with a broad irregular black band on the posterior margin of each segment; the second and third segments mostly red on the sides; orbito-frontal bristles in a double row in both sexes; antennæ black or brown; arista with the second joint about one-fourth of the length of the third; palpi red; wings with the third longitudinal vein armed with a few setæ near the base; legs black, with tibiæ piceous. This rare species was captured by Mr. C. W. Dale, at Freshwater, I. of W., in June, 1880.

D. FRONTATUS, Bohem.

This species resembles the former in general form and colour, being only of rather a more yellow-grey; it differs, however, by having the eyes much nearer together in the male than in the female, and by the frontalia having only a single row of bristles on each side in the former sex; the two first joints of the antennæ are also testaceous, and the arista has the second joint very short, and the third thickened along its basal third; the palpi are black; the proboscis is much longer than in *D. plebejus*, also narrow, pointed, and projecting forwards; the abdomen is rather lighter in colour than in *D. plebejus*, marked by irregular black bands and reflections, and has the sides of the segments red and translucent; the wings have the first (auxillary branch), third, and fifth veins setigerous; and the tibiæ are darker in colour than in *D. plebejus*. This species, which is not uncommon, is quite aberrant, and might be placed in the genus *Aphria* as well as in *Demoticus*, the proboscis being narrow and somewhat elongated, and the fronto-orbital bristles in a single row only in the male. Zetterstedt and Boheman seem only to have known the female, and Schiner does not allude to any difference between the sexes. I have captured this fly in different parts of England.

5.—GONIA, Mgn.

Gen. ch.—Body ovato-oblong; head very wide and tumid; eyes bare, small, and very widely separated, in both sexes; frontalia broad and ciliated, with a number of rather fine bristles arranged irregularly in several rows in both male and female; cheeks and mentum swollen, and more or less hairy; antennæ long and narrow, with the third joint much longer than the second, especially in the male; arista bent upwards in the middle, and having the second joint much elongated, it being in some species rather longer, and in others rather shorter, than the third; abdomen without setæ on the disc or middle of the segments; feet with the claws and pads (pulvilli) very small; the males are rather difficult to discriminate from the females.

1 (2) (3) Abdomen quite black ....1. *Försteri*, Mgn.
2 (1) (3) Abdomen black, with narrow white bands ... .2. *fasciata*, Mgn.
3 (1) (2) Abdomen red, with a dorsal black stripe.
4 (5) Face dull, without glittering reflections ... .3. *divisa*, Mgn.
5 (4) Face with white or yellow glittering reflections.
6 (9) Abdominal dorsal stripe narrow.
7 (8) Fourth abdominal segment black .... 4. *capitata*, De Geer.
8 (7) Fourth segment red ....5. *trifaria*, Zeller.
9 (6) Abdominal dorsal stripe wide.
10 (11) Fourth abdominal segment only black ....6. *lateralis*, Zeller.
11 (10) Third and fourth segments black ....7. *ornata*, Mgn.

G. Försteri, Mgn.

This fine species, usually the largest in the genus, has the head reddish-yellow, with silvery reflections; the antennæ have the basal joints testaceous, and the third black or grey; the second joint of the arista is a little curved and rather longer than the third; the palpi are yellow; the cheeks and chin are almost bare; the thorax is rusty-black, and indistinctly striped; the scutellum is brownish-yellow; the abdomen is shining blue-black, without any white bands or reflections; the legs are black, or nearly black, in this, as well as in all the other species in the genus. Rare.

G. fasciata, Mgn.

ruficeps, Wlk.

This species is very similar to *G. Försteri*, but is usually smaller, and has the shining black abdomen marked with narrow white bands on the front edges of the segments; the thorax is also rather more distinctly striped, and the cheeks are more hairy. Not common.

G. divisa, Mgn.

This species differs from all the others by having the frontalia and cheeks of rather a dull yellow colour, without gloss or glitter; the cheeks are thickly covered with hair, the abdomen is of a transparent red colour, marked with a broad, dorsal, black, longitudinal stripe, and with very narrow transverse white bands, which are often indistinct. Rare.

G. capitata, De Geer, Zett., Rnd., *non* Mgn.

Three distinct species have been mixed together under this name, viz.: *G. capitata*, *G. lateralis*, and *G. ornata*, so it is rather difficult to determine which is the one named by De Geer; upon reference, however, to his figure of this fly, I find that it gives (though rude) a very characteristic delineation of a female specimen, as described by Zetterstedt and Rondani; therefore, I shall adopt their diagnosis. Head, with frontalia, rather wider in the female than in the male; face glistening with yellowish-white reflections; cheeks nearly bare; antennæ with the basal joints testaceous, the third joints black or grey, and about four times the length of the second in the male, and only about twice in the female; arista with the second joint rather shorter than the third ; thorax much the same as in *G. Försteri* ; abdomen reddish-yellow, with a black longitudinal dorsal stripe, narrow in both sexes over the two first segments, being not wider than the space between the two central setæ on the edge of the second segment. In the male it continues of the same width to near the bottom of the third ring, where it spreads out and covers the fourth segment. In the female (whose abdomen is shorter and rounder) the black stripe is dilated, and covers the middle of the dorsum of the third segment, as well as the fourth segment, leaving the sides of the third, and a little of those of the fourth, however, always red. The bases of the third and fourth segments are encircled by a wide white band, and the base of the second also by a narrow one. Not common.

G. TRIFARIA, Zeller.

The males of this species very closely resemble those of *G. capitata*, but differ in the following particulars. The abdomen is more translucent, and the narrow longitudinal black band extends of the same width to the apex, leaving the fourth segment red on the sides like the others ; the circular white bands are also very narrow on the edges of both the second and third segments, but form a wide white patch on the sides of the fourth. I do not know the female of this species. In Miss Prescott Decie's collection, and also in that of Mr. Billups, the latter specimen was captured at Dulwich.

G. LATERALIS, Zeller, Zett., Rnd.

This species differs from *G. capitata* by having the abdominal stripe twice as wide, and not straight on the sides ; it is dilated at the top over the first segment, and a little again on each side opposite the junction of the second and third segments, finally spreading out and covering the whole of the last ; the sides of the third segment are entirely red, as in *G. capitata*, which this species closely resembles, except by the width and shape of the abdominal stripe, and, as pointed out by Rondani, by the middle setæ on the border of the third segment of the abdomen being placed a little more forward than the others in the same row, so that they are placed on the disc, and not on the edge. This is not an uncommon species, I have received several from Mr. Bridgman, captured in Norfolk, and Mr. Bignell sent me one some years ago, which he had bred from a Lepidopteron.

G. ORNATA, Mgn.

This species differs from *G. lateralis*, by having the thorax usually more distinctly striped by four black bands, and having the abdominal dorsal broad stripe still wider (in the male), straight on the sides, and only continued to the base of the third segment, when it expands and covers the whole of that ring (except a small patch on the side), as well as all the fourth segment. The white transverse fascia is rather wider upon the fourth segment than upon either of the others, but that upon the second is the narrowest. Not rare, I have received specimens from Mr. C. W. Dale, and also from Mr. Bridgman.

NOTE.—In the generic table the genus *Degeeria*, Mgn., was omitted altogether, as well as the name of the genus *Phorocera*, Dsv. They should stand thus when inserted, viz. :—

68 (67) Forehead not white ; fourth longitudinal vein bent at an angle .. 35. FRONTINA, Mgn.
68*a*(68) Fourth longitudinal vein bent in a curve...... .. 35*a*. DEGEERIA, Mgn.
69 (66) Eyes hairy........ ....36. PHOROCERA, Dsv.

(*To be continued.*) 125

NOTES ON SOME BRITISH AND EXOTIC *COCCIDÆ* (No. 20).

BY J. W. DOUGLAS, F.E.S.

PLATE I.

LECANIUM NIGRUM.

Lecanium nigrum, Nietner, Enemies of Coffee Tree, p. 9 (1861); E. T. Atkinson, Journ. Asiatic Soc. of Bengal, vol. lv, p. 284 (1886); E. Ernest Green, Indian Museum Notes, vol. i, p. 117, pl. vii, figs. *a—k* (1889).

♀ adult. Scale long-oval, a little narrowed and produced in front, brown-black, or black, smooth, shining, arcuate lengthwise, gibbous in the middle, slightly and very briefly carinate on the marginal area in front, on each side of the median portion a row of small foveæ (sometimes wanting), margin not produced, the sides next to it punctured. Under the microscope the whole surface is seen to be covered with tesselation of closely approximate, small, yellow dots and punctures. The scales full of pink eggs and larvæ of ordinary form. Antennæ of 8 joints (fig. 1 in margin); the first two broad, short, equal in length; 3rd longest of all; 4th and 5th equal, each half the length of 3rd; 6th and 7th equal, shorter than 4th and 5th; 8th gradate, pointed, as long as 6th and 7th together (in some specimens it is constricted and simulates two joints), with five or six long hairs, one of them (apical) much the longest; the other joints, except 3rd and 4th, with one or two hairs each. Legs (fig. 2 in margin) long, slender; coxæ with one very short hair; trochanters with one very long hair; femora with two very short hairs near the apex; tibiæ and tarsi in length subequal, their articulation distinct; digitules of tibiæ fine, ordinary; those of the claw long, broad, much dilated at base and apex as figured, less so in exceptional examples. Length, 3·5—4 mm.

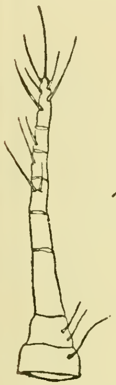


Fig. 1.

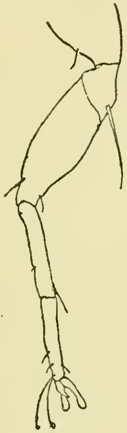


Fig. 2.

On stems and midribs of the under-side of leaves of *Justicia Macdonaldi*, received by Mr. S. J. McIntire from the Botanic Gardens, George Town, Demerara, kindly forwarded to me on May 28th, 1889, and, subsequently, a greater number of empty scales on small stems of *Combretum Aubletii.* These agree fairly well with Mr. Atkinson's scanty description (*l. c.*) and Mr. Green's figures (*l. c.*) of the ♀ scales of *L. nigrum*; and they are identical with ♀ scales of that species sent to me in 1888 from Ceylon by Mr. Green, who states that they are numerous on and injurious to coffee trees, *Cinchona* and *Croton.* In the plate quoted he also figures the larva, the male and its scale, but no mention is made by either author of the antennæ and legs of the female, of which particulars are now supplied. The scales from Demerara, in nearly every instance, had been attacked by parasites, which had caused the antennæ and legs to be at least partially malformed; fig. 1 on the plate represents an antenna of this character, the true condition is shown in the margin above.

The species belongs to Signoret's 4th section of the genus, which includes *L. hibernaculorum*, *coffeæ*, *hemisphæricum*, &c.

One of the stems of *Combretum* was closely covered with a tough, silky web which a Lepidopterous larva had formed over the adherent scales of *Lecania*; it had probably fed on the bodies of the insects, for the scales were reduced to small fragments. In a cocoon of the silky material was a pupa, but it was dead. Is this another coccophagous species? (*cf.* Ent. Mo. Mag., vol. xxiv, p. 225).

LECANIUM DISTINGUENDUM, *n. sp.*

♀ adult. Oval, slightly attenuated and pointed posteriorly, the form frequently irregular and the size less than the dimensions given below; convex, smooth, shining, brown, indistinctly and irregularly mottled with whitish; ultimately a median longitudinal carina is developed on the abdominal portion, with three or four deep foveæ on each side of it. Legs and antennæ atrophied.

Length, 5, breadth, 3, height, 2·5 mm.

In the immature state, that is just before oviposition, broad-oval, flat-convex, light reddish, a transverse line on the first third, a large median blotch posterior to it, and a long blotch on each side of this, white. Antennæ (fig. 4a) of 7 joints, tapering; 1st short and wide; 2nd shorter; 3rd very long, nearly as long as 4–7 together; 4th and 5th much shorter, subequal; 6th about the same; 7th a trifle longer than 6th, with a few stiff hairs at apex; the 3rd, 4th and 5th deeply notched on inner side. Legs (fig. 4b), tibiæ but little longer than tarsi, the latter with two long, and claws with two short, digitules. In a few days the scales collapsed, the colour became red-brown, and the light markings disappeared; yet the bodies were full of unextruded eggs. In a still earlier stage the form of the scale is more regularly and narrower oval, almost pointed at each end.

♂ adult. Scale white, glassy, of the ordinary *Lecanium* form. The imago of the ordinary character, bright piceous; wings pale, the apical half of the costa carmine. Legs fuscous, hairy. Antennæ (fig. 4c) of 10 joints, with short, stiff, pale hairs, on the last joint three of the apical ones clubbed. Length, 1·5 mm.

Larva ochreous; antennæ of 6 joints; the 3rd, 4th, 5th and 6th with one specially long hair, the 6th also with one more very much longer than any on it or the other joints; the tarsi and claws with the usual digitules.

A pale median dorsal blotch is usually to be seen on the young ♀ scales of several species of *Lecanium, e. g., L. pyri*, Schrk., *L. tiliæ*, Linn., *L. variegatum*, Goethe, &c., but I have not observed the other pale markings herein noted, nor seen them described, in any other species except *L. fuscum*. Yet, as I regard such evanescent markings as incidents and signs of immaturity, some or all of them may be of general occurrence, but not noticed, because the scales are not observed in the young state.

Found at Delamere Forest gregarious on last year's shoots of *Vaccinium myrtillus* by Mr. R. Newstead, of Chester, from whom I received specimens of the ♂, and of the ♀ in different stages of development. He also sent drawings, now reproduced, and the following particulars :—

> "On April 24th, 1890, in a sheltered portion of Delamere Forest, Cheshire, I found, on three or four plants of *Vaccinium myrtillus*, a quantity of both ♂ and ♀ scales (the latter immature) of this species. The males began to emerge on May 5th, and continued to do so for several days. I found males in the open air about the middle of May; they were very skittish, frequently taking short flights; they lived for several days, but did not readily copulate in confinement.
>
> "Although I have searched the *Vaccinium* in many parts of the Forest I have failed to find another colony of this species, and as there are so many acres of *Vaccinium* it was merely by chance that I discovered the only known locality for the insects."

The adult ♀ scales when found some weeks afterwards were full of larvæ, but the mother insects had become entirely shrivelled, and could not be restored by boiling in caustic potash; thus it was fortunate the antennæ and legs had been obtained previously from younger forms; and this may give a serviceable hint for procedure with other species in future.

Kaltenbach, in his "Pflanzenfeinde," p. 420, has described a *Lecanium vaccinii*, but, as Signoret has stated (Ess. Cochen., p. 466), the description shows that it was no *Lecanium*, but a *Chionaspis*, so it does not count here. Goethe, in the "Jahrbuch d. nassauischen Verein für Naturkunde," 1884, p. 125, described, far too briefly, *Lecanium vaccinii macrocarpum* found on the small prickles of the American bilberry in the Botanic Garden at Karlsruhe. The ♀ scale is said to be "very small, light brown, and before impregnation is strongly fringed, with eye-points between the antennæ, which latter have small knobbed hairs. The ♂ was not seen." Such an imperfect description would not identify any species with precision, but it in no way points to our present species. No other *Lecanium* has been recorded as having been found on *Vaccinium*, and *L. distinguendum* appears not to have been obtained on any other plant, and to be undescribed.

In one of the ♀ scales of *L. distinguendum*, besides a number of living larvæ, was a single white pupa of a Hymenopterous parasite which occupied a large portion of the space; the presence of the larvæ showed that the parasite had attained its full development as a larva without destroying all the eggs of the *Lecanium*. This, when perfect, and one or two of other parasites issuing from these scales, I sent to Mr. L. O. Howard, Assistant Entomologist of the United States Department of Agriculture, Washington, who writes :—

"The single specimen is a new species of the genus *Encyrtus*. Many species of *Encyrtus* have been described from Europe, but this seems to differ from all. It comes closest to *Encyrtus lineola*, Mayr, but is separated by distinct characters. The other specimens were a *Pachyneuron* (of the same species as the two from *Lecanium fuscum*), which I cannot determine specifically."

Early in August Mr. Newstead found among some scales of *L. distinguendum* that he had collected two Rhyncophorous beetles, *Brachytarsus varius*, F., which species, as well as *B. scabrosus*, F., are well known to feed, when in the larva state, on various *Coccidæ*. Among other authors Dalman (K. Vetensk. Acad. Handl., f. 1825, p. 368), writing of his *Coccus cypræola*, says:—

"Besides several species of *Pteromalinæ* which infest this Coccid, another noxious parasite is found in it, viz., *Anthribus varius*, as I have often had occasion to observe. I have also since found in another *Coccus* a rarer species of *Anthribus*—*A. scabrosus*. These two species appear to form a true genus distinct from *Anthribus*."

PULVINARIA BETULÆ.

Coccus betulæ, Linn., F. S., 1017; S. N., 740, 7. Fab., Sp. Ins., 394, 8; Mantiss., ii, 319, 10; Ent. Syst., iv, 226, 12; Syst. Rhyng., 308. Modeer, Act. Goth., i, 23, 16; Gmel., Syst. Nat., i, 4, 2216, 7. De Villers, 560, 5. *Pulvinaria betulæ*, Sign., Ess. Cochen., p. 207.

♀ adult. Scale broad, obcordate, nearly as broad as long, slightly convex, shining, dark piceous-brown, the marginal area broadly (band-form) rufo-testaceous (this coloration probably not constant); the disc scarcely punctate, but with two or three slight transverse ridges; the marginal band with several very slight equidistant transverse lines; the posterior edge widely but shallowly emarginate, the sides of the notch divergently rounded off from the narrow, close, rather long anal cleft; the white cottony ovisac ample, raising the scale, extending a little beyond it at the sides and very much behind. Antennæ of 8 joints (fig. 5a); 1st very broad, short, with a few hairs; 2nd not so thick, a little longer; the rest more slender; 3rd longest of all, with one hair; 4th and 5th much shorter, subequal, each with one hair; 6th and 7th still shorter, subequal, with one or two hairs; 8th about the same length, pointed, sides gradate, with several long hairs, of which one (apical) is longer than the others. Legs stout (fig. 5b); tibiæ with two hairs near the apex; tarsi obtuse at apex, more than half the length of tibiæ, with two long finely capitate digitules; claw long, strong, with two shorter digitules dilated at the extremity.

Length, 5, breadth, 5 mm.

Described from one of two examples found on birch trees (*Betula alba*) at Delamere Forest, July 20th, 1890, by Mr. R. Newstead, who has kindly furnished the figures.

Signoret (*l. c.*) cites the authorities given above, and describes *Pulvinaria betulæ* as the *Coccus betulæ* of Linné, but he gives only the characters of the ♀ scale, thus:—

"In the most advanced state this species much resembles *P. vitis*, which, for the sake of comparison, we take as the type of the genus. It is almost as long as broad, rugose, of a dark brown colour and covered, especially on the median line, with small greyish tubercles of an elongate form, which are composed of a secretion soluble in ether. The anal emargination is very wide."

This agrees fairly well with the specimen before me except as to the tubercles, which do not exist; they probably pertain only to the young immature form, and are the same as designated by Modeer in his account of that stage of growth as "ögon" (eyes, buds, pips, points); or it may be that my specimen is abnormal, and the absence of tubercles has been caused by the enervating influence of the parasites that had evidently affected the insect; but as the other characters differ but very little, and only one species of *Pulvinaria* has been obtained from the birch, I conclude that this is the same as Signoret's. He gives no particulars of antennæ or legs of the adult, but only the characters of the larva. The male is unknown.

Linné, in the "Fauna Suecica" (*l. c.*) describes his *Coccus betulæ* very briefly, thus:—

"Habitat in *Betula alba* ramorum divaricationibus solitarius," and he adds nothing in the subsequent "Systema Naturæ."

Fabricius and De Villers merely refer to Linné. Gmelin, in his edition of the "Systema Naturæ," has:—

"Habitat in Europæ *Betula alba*, teres, spadiceus."

Modeer has:—

"Björk Fästflyet (*Betulæ albæ*), ♀ scale oval, cut out posteriorly, dark red-brown; when young pale rust-colour, with dark points.

"Found in angles of twigs of birch. Somewhat larger than a pea. Lays in the beginning of June a considerable quantity of eggs in a conspicuous white cottony nest, which becomes so much extended that the scale is raised up on it from behind perpendicular."

There is no reference to Linné, so that even with this description by Modeer (whose work, by the way, Signoret says [*l. c.* p. 5] he had not "analyzed") the identification of the *Coccus betulæ* of Linné was by its habitat on the birch, and by repute, more than by description; but Modeer's description points undoubtedly to a *Pulvinaria*, and Signoret's species appears to be the same; and so, in default of anything to the contrary, rather than by positive facts, the species described by these authors may be accepted as the *Coccus betulæ*, Linn.

Its recognition as a British species rests on the works of the authors quoted by Stephens in his "Catalogue of British Insects" (1829), ii, 368, viz., Berkenhout, Stewart, Samouelle, and Turton, none of whom (as indicated) gives a description or information when or where it has been found in Britain; nor can I trace any subsequent record of its occurrence, and Walker omits it from his "List of British *Homoptera*" (1860), so that it is virtually now added to the British fauna.

On December 23rd, 1885, on the small branches of an alder (*Alnus glutinosa*), a near ally of the birch, at Lewisham, I found several scales of a *Pulvinaria*, but as they were then six months old, perforated by parasites, and (with the ovisacs also) black with the filmy grime of coal smoke that defiles every exposed thing within many miles of London, I could do nothing with them, and I have found none since, until on August 21st, 1890, on the same tree, there were half a dozen of the same sort of scales in better condition than on the former occasion, though evidently past their prime. Comparing them with *P. betulæ*, the scales conform very well to the foregoing description of that species from birch, the chief difference to be perceived being that in these the legs and antennæ are much more slender, and there is a very slight variation in the relative length of some of the joints of the antennæ, of which I give Mr. Newstead's figure for comparison (5c). As at present advised, I do not think there are sufficient grounds to do more than to call this "var. *P. alni*," but this remains an open question.

Adjacent to some of the ♀ scales were two or three of those of the ♂, from which the imago had not been developed.

EXPLANATION OF PLATE I.

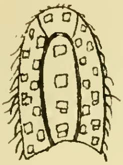
Page 95—*Lecanium nigrum*, ♀, fig. 1, antenna (abnormal).
„ 65— „ *sarothamni*, ♀, fig. 2a, antenna, 2b, leg.
„ 67— „ *ciliatum*, ♀, fig. 3a, scale (profile), 3b, scale (front view), 3c, antenna, 3d, ♂ scale (broken).
„ 96— „ *distinguendum*, ♀, fig. 4a, antenna, 4b, leg, 4c, ♂ antenna.
„ 98—*Pulvinaria betulæ*, ♀, fig. 5a, antenna, 5b, leg.
„ 100— „ „ var. *alni*, ♀, fig. 5 c, antenna.

153, Lewisham Road, S.E.:
October, 1890.

MICROPTERYX SANGII; A NEW SPECIES FROM BIRCH.

BY JOHN H. WOOD, M.B.

When describing the larvæ of some of our Micropteryges (vol. xxvi, p. 1) I pointed out that, in addition to the five species known to inhabit birch (*Betula alba*), there was also a sixth, which had not, up to that time, been differentiated, and for which I proposed provisionally the name of *inconspicuella*.



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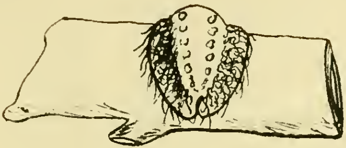

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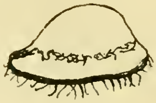

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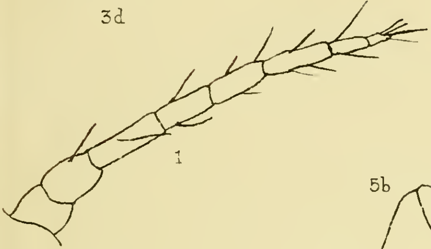

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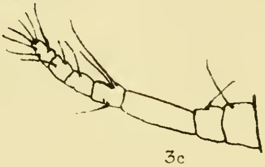

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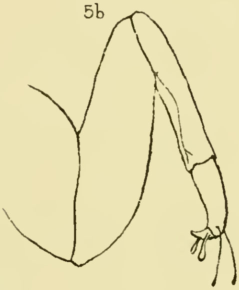

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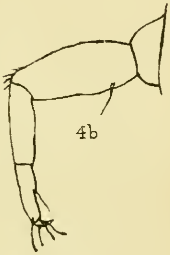

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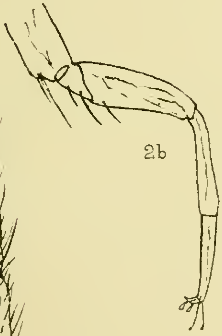

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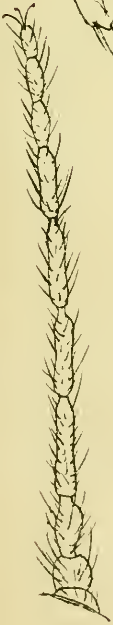

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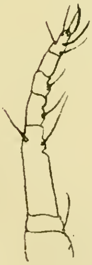

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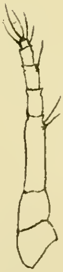

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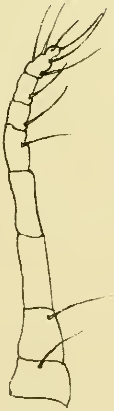

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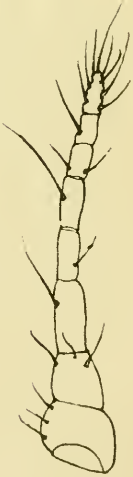

5a

R. Newstead Del et Lith

However, the subsequent breeding of a pretty long series of this so-called *inconspicuella*, a species possessing a pallid larva, has shown that it is in reality *semipurpurella*, and that the new species is the one with the grey larva, which was erroneously referred in the paper to *semipurpurella*. Under these circumstances the name of *inconspicuella* will have to drop altogether, whilst one must be found for the insect having the grey larva. Now I learn from Mr. Stainton that he possesses a series of a *Micropteryx*, bred some years ago by the late Mr. Sang from birch, which appears to be identical with the insect I have reared from these grey larvæ, and it seems to me I cannot, therefore, do better than call it *Sangii*, in memory of that good observer.

The following is a description :—

Exp. al., 5¼—5¾ lines. Head grey or grey-brown ; paler in the female. Antennæ about half as long as the fore-wings. Fore-wings purple, flecked with pale golden ; with a large, upright, pale golden spot, reaching from the anal angle fully half way across the wing.

Sangii is closely allied to *semipurpurella*, and is probably mixed up with it in most collections, but may be distinguished by attention to the following points. In *semipurpurella* the antennæ are more than half as long as the fore-wings, thus they are longer than in *Sangii* ; the anal spot is small, usually inconspicuous, not reaching to the middle of the wing, and less upright than in *Sangii*, frequently it is absent altogether, only the fasciculus of pale hairs in the fringe being present. Turning to the "Manual," the description there of *semipurpurella*—"With a large pale golden spot . . reaching half across the wing ; antennæ more than half as long as the fore-wings"—apparently partakes of the characters of both insects, and it would be a nice question as to which has the best right to the name of *semipurpurella*, were it not that the antennal differences being of higher import than those of the wing spot settle the matter in favour of the species with the longer antennæ.

Tarrington, Ledbury :
March 11*th*, 1891.

ON THE ERRONEOUS INCLUSION OF *CATOPTRIA* (*GRAPHOLITHA*) *DECOLORANA*, FRR., IN THE BRITISH FAUNA.

BY C. G. BARRETT, F.E.S.

This paper might with almost equal force be denominated "a discourse on the peculiar vitality of error." As a general rule, in this country, the report of the capture of a species new to the British list is subjected to some degree of careful scrutiny, and the evidence pretty closely sifted, and if it is also a species the usual *range* of which does not appear to approach our geographical position, great doubt is felt until, by the capture of further examples, the claim of the species to a place in our lists is established. But in the case of *Catoptria decolorana* no record, as far as I can ascertain, exists of the capture of a single specimen in these islands in any stage of its life, and the only intimation of its existence is found in a quotation (imaginary) of a record *which never was made.*

The earliest notice of the name which I can find in our publications is in the "Entomologist," vol. xiii, p. 269, in a paper by the late Mr. Walter Weston, where he stated that, "Mr. Machin records having reared this species in some numbers from larvæ feeding in the seed-heads of golden rod (*Solidago virgaurea*), collected at the end of September and in October in woods in Kent and Surrey." But no such statement was ever made by Mr. Machin. In the same periodical, vol. xii, p. 109, he stated in the words quoted that *Catoptria æmulana* had been so reared by him, and he went on to say that an allied form, which he believed to be a distinct species, occurred in the salt marshes at the mouth of the Thames. He indicated some of its distinctions, and suggested *Aster tripolium* as its probable food-plant. In order to be quite certain of my point, I have written to my old friend Mr. Machin, and he replies that he never made the statement attributed to him with regard to *decolorana*, but has always held that the species reared by him from *Solidago* to be *æmulana* (as it undoubtedly is). In the same year (1879) he obtained larvæ in the flowers of *Aster tripolium*, and reared the moths in the following summer. I was equally successful with the larvæ which he sent me, and thereby accumulated the evidence for which I had been waiting, in order to introduce and describe the new species, which took the name of *tripoliana*. As far as I have been able to ascertain, no previous description of *tripoliana* exists, and the name should apparently stand for the salt-marsh species.

But Mr. Weston's statement with regard to *decolorana* is perplexing. I do not believe that he intentionally misquoted Mr. Machin; he must have trusted to memory, and some confusion of names must have crept in. He was a genuine and earnest student of the *Tortrices*, and had an extensive acquaintance with them. When publishing the series of notes in which this mistake occurs, he did me the honour of consulting me on many difficult points, and sent me portions of his MS. from time to time, but certainly the portion now in question did not come under my eye, or I should not now be compelled, with regret, to controvert it.

In the "Entomologist" for December, 1881, the editor inserted a plate, consisting of figures of recently noticed varieties and novelties, and among them a figure of *Catoptria decolorana*. In this, Mr. Carrington did good service, for the figure represents the genuine insect, and was, very likely, taken from that of Herrich-Schäffer, but it does not seem to have occurred to anybody to notice that this figure did not represent any known British species, and nost assuredly not that reared from flowers of *Solidago*; consequently, *decolorana* has appeared as a British insect, not only in Mr. South's adaptation of Staudinger and Wocke's catalogue, but in every labelling and exchange list published since, or nearly so, and the name is to be seen in nearly every cabinet of recent arrangement. I cannot say that this error has been *overlooked* for ten years, but inasmuch as I had already (Ent. Mo. Mag., vol. xvii, pp. 82—4) stated rather fully the evidence upon which the true names of the two species under consideration rested, I hardly felt called upon to interfere further. But recently, in looking through Sorhagen's "Kleinschmetterlinge der Mark Brandenburg," I find that this error has found its way to Germany, and that my (totally innocent) friend, Machin, is there credited (page 107) with the statement that the larva of *decolorana* feeds in seed-heads of *Solidago virgaurea*.

As the larva of this species is (I believe) unknown, it is quite time to check the dissemination of this error.

Of the true *decolorana* I have specimens sent by the late Prof. Zeller as types. They are slightly smaller than *æmulana*, of an extremely pale yellowish-grey, almost without definite markings, but with a few brownish flecks, which become more abundant beyond the middle. The costal streaks are visible, but very faint, and the ocellus or "shield" is visible from being devoid of brown flecks, and encloses two short faint brown lines. The wings have no trace of the distinct angulated fascia and basal markings seen in *æmulana*, in fact, *decolorana* is as suitable a name as it could have. It inhabits eastern and central Germany, and north and east Russia.

39, Linden Grove, Nunhead, S.E.:
January, 1891.

Pempelia adelphella.—Concerning continuity of error, it may be well again to point out that, with all respect for published lists, there is not a particle of evidence to show that *Pempelia adelphella*, Frr., has ever been taken in this country. It is a very pretty species, found, I believe, in Germany and Russia, and which, if only for its beauty, would be most welcome here, little likely as it is to occur. It resembles

Pempelia formosa more than any other species, but has no resemblance whatever to *P. hostilis*, Steph., and the only conceivable reason for the confounding of the two together seems to be that the basal portion of the fore-wings in *adelphella* is of a rich red, almost brick-red, and that the same portion of the wings in *hostilis* is of a faint shade of the same colour. This error was most emphatically pointed out by M. Ragonot (Ent. Mo. Mag., vol. xxii, p. 55), yet the name *adelphella* continues to appear in many collections and lists.—Id.

DESCRIPTION OF A NEW SPECIES OF *ANASPIS* FROM SCOTLAND, WITH SOME REMARKS ON THE BLACK SPECIES OCCURRING IN BRITAIN.

BY G. C. CHAMPION, F.Z.S.

The publication of the Rev. W. W. Fowler's Monograph of the British *Anaspis* (Ent. Mo. Mag., xxv, pp. 331—338) has induced me to examine the black species contained in my collection, two of which have been separated as distinct for the past ten years, but not named. One of these is the species described by Mr. Fowler under the name of *A. Garneysi*; this I have captured in some numbers at Loughton and Darenth, and it is probably not uncommon in the London district, Dr. Power having met with it in various localities. As Mr. Fowler states (*op. cit.*, p. 334), it comes very near *A. nigripes*, Bris.; in fact, it agrees precisely in its male characters with the description of that insect, from which it differs in its paler legs, shorter thorax, and larger size. It is probable that this and the species described below under the name of *A. septentrionalis* have been confounded by continental authors with *A. frontalis*, notwithstanding the exceedingly well-marked characters to be found in the form of the ventral segments of the male. The colour of the legs is a character of very questionable value; in fact, most of my examples have the posterior femora infuscate or piceous, instead of "almost-entirely yellow." The second species I am quite unable to identify from the works of Costa, Mulsant, Thomson, or Emery; the following is a description of it:—

ANASPIS SEPTENTRIONALIS, *n. sp.*

Elongate, black, the front of the head and the palpi flavo-testaceous, thickly and finely pubescent, the prothorax and the elytra very finely transversely strigose. Antennæ black, the three or four basal joints flavo-testaceous, filiform, in the male very elongate and slender, in the female considerably shorter, the penultimate joints in both sexes longer than broad, but much more elongate in the male than in the female; prothorax about one-third broader than long, bisinuate at the base, the hind angles rectangular; elytra with the transverse strigæ more distinct than on the prothorax; beneath black; legs comparatively slender: the anterior pair (including the coxæ) flavo-testaceous, with the tarsi slightly darker, the middle pair fusco-testaceous, with the tibiæ, except at the base, piceous or fuscous, and the tarsi, except at the base of the first and second joints, infuscate, the hind pair piceous, the extreme base of the tibiæ excepted; the tibial spurs testaceous; the anterior and middle tarsi slender in both sexes.

♂. Anterior tarsi very feebly dilated; anterior and intermediate tibiæ sinuate within, the anterior pair slightly curved inwards towards the apex. Third ventral segment elongated, produced in the middle behind, and furnished at the apex with two long laciniæ or appendages, these latter narrowly separated at the base, almost straight, extending to the middle of the fifth segment, and becoming slightly divergent posteriorly, the space enclosed by them unimpressed; fifth ventral segment very deeply and abruptly emarginate at the apex, but not at all depressed in the middle in front of the emargination.

Length (with the head extended) 3½—3¾ mm. (♂ ♀).

Two examples of this species were captured by myself at Aviemore, Inverness-shire, in July, 1876. *A. septentrionalis* is closely allied to *A. frontalis*, Linn., but may be easily known from it by the more slender legs and antennæ, and by the well-marked male characters. The male of *A. frontalis* has the fifth ventral segment broadly excavate in the middle from the apex nearly to the base* (this part being quite unimpressed in *A. septentrionalis*), and the apex much less deeply emarginate; the laciniæ very distinctly curved inwards at the apex; and the anterior tarsi strongly dilated (very feebly so in *A. septentrionalis*). The antennæ in the male of *A. septentrionalis* are very elongate and slender, the insect thus resembling *A. Garneysi*, Fowl., but this latter has the laciniæ strongly divergent and curved, and enclosing a large broad space; the anterior tarsi are equally slender in these two species, and only very feebly dilated in the male. In the female of *A. septentrionalis* the intermediate legs are a little darker than in the male. The different male characters, &c., distinguish it from *A. pulicaria*, Costa, and *A. nigripes*, Bris., and the non-moniliform antennæ from *A. rufilabris*, Gyll., and *A. melanostoma*, Costa.

Mr. Fowler remarks (*op. cit.*, p. 331) that the genus *Anaspis* may be more widely spread than at present known: it is more probable, however, that it will prove to be confined to the Palæarctic and Nearctic regions, as in North America the genus only just reaches the southern boundary of the United States, and is replaced in Mexico and southwards by *Pentaria* and an allied genus; the single species recorded from the Australian region is in all probability not a true *Anaspis*.

11, Caldervale Road, Clapham Common, S.W.:
December, 1890.

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* This character is not noticed by Mr. Fowler, though it is mentioned by recent authors.

ON TWO NEW SPECIES OF MEXICAN *HISTERIDÆ*.

BY G. LEWIS, F.L.S.

Mr. Julius Flohr has kindly sent me two new species recently discovered by himself in Mexico; one of them pertains to a new genus, and was found within the precincts of an ants' nest, the other is a true *Hister*, and one bearing remarkable characters.

HISTER LATISTRIUS, *n. sp.*

Breviter ovalis, convexiusculus, niger nitidus; fronte tenuissime punctulata, stria subintegra; pronoto stria externa integra interna basi abbreviata; elytris striis 1—3 *integris,* 4 *basi abbreviata,* 5—6 *dimidiata; pygidio propygidioque lævibus; prosterno haud striato; tibiis anticis emarginatis.*

Long., $4\frac{3}{4}$ *mill.*

Hab.: Tepic.

Head with extremely fine and scattered punctuation, frontal stria semicircular, and scarcely meeting anteriorly; thorax transverse, impunctate, outer stria complete and looped behind the anterior angle, inner stria much abbreviated before the base, but continues anteriorly behind the neck unbroken and slightly crenate; the elytra have broad but not deep striæ, each of which is feebly crenate on either edge; 1—3 complete, 4th a little abbreviated at the base, 5th and 6th, apical, nearly equal in length, and terminating just beyond the middle. The three inner striæ are less broad than the others. The pygidium and propygidium are nearly smooth, being more feebly punctate than those in *H. cænosus*, Er. The prosternum is without striæ, all the sternal plates are smooth, mesosternal stria complete. The anterior tibiæ are peculiar. At their apex there is a large tooth, which is minutely tridentate at its apex, and between it and two or three small teeth at the bases, the outer edge is conspicuously emarginate.

The species may be placed near *H cænosus*, Er.

TRICHORENINUS, *n. gen.*

Orbicularis, parum convexus setosus; caput retractum. Mandibulis robustis, in mediis valde unidentatis; antennis brevibus, sub fronte margine insertis, clavâ articulo unico ovato et cæteris sensim incressatis, funiculo magno. Prosternum modice carinatum, bistriatum basi inciso; mesosternum marginatum utrinque profunde sinuatum in medio acuminatum; pygidium parum convexum. Femora et tibiæ dilatatæ.

This genus comes very near to *Reninus*, Lewis, 1889 (*Renia*, 1885), but the species cannot be placed in it. It is sparsely covered with setæ; the legs are less dilated with the angle on the outer edge much nearer the base. The dorsal sculpture also is very different, and the prosternum carinate. The genus also appears to be similar to *Ulkenus*, Horn, but in Horn's genus the mesosternum is semicircular in front. The setæ seem liable to be rubbed off, but I think in a fresh example each puncture would bear one.

TRICHOREXINUS FLOHRI, *n. sp.*

Orbicularis, subconvexus, piceo-brunneus, setosus. Elytris striis integris; pygidio propygidioque tenuissime punctatis, prosterno bistriato; pedibus dilatatis. *Long.*, 3 *mill.*

Hab.: Atlixco.

Orbicular, rather convex, pitchy-brown setose; head flattish, with shallow and irregularly formed punctures, the marginal striæ are elevated, and particularly so at the base of the clypeus, where they do not join, but form a frontal canaliculation; the thorax is similarly punctured to the head, with a complete stria running close to the edge; the elytral striæ are apparently complete, the three outer ones are distinct and a little elevated, especially the first, the sutural ones are evanescent; the pygidium is inconspicuously sculptured after the manner of the thorax. The anterior tibiæ are dilated and semicircular, and spinose on the outer edge; the hinder tibiæ are more dilated and angulated before the base, but they are not so broad as the tibiæ of *Reninus* or *Eretmotus*.

Besides the example sent by Mr. Flohr, I have a second, in bad condition, obtained at Guanajuato by Monsieur Sallé.

Folkestone: *February*, 1891.

Wiener entomologischen Verein.—An Entomological Society of Vienna was established in February, 1890; it now comprises 58 Members, with Herr Rogenhofer of the Vienna Museum as Honorary President. Herr Johann Prinz is President. It has just published a first "Jahresbericht," consisting of 31 pages, which includes an address by the Honorary President, Local Lists, and biological notes, &c., a very modest beginning. With the exception of the Honorary President, the list of Members seems at present to be made up of local collectors, a large number of them holding official positions on the Austrian railways, and the aim of the Society appears to be that of developing a knowledge of the local insect-fauna. We think it is the first purely Austrian Entomological Society that has been founded, and as such we shall watch its development with interest and expectation.—EDS.

A means of preserving collections of insects in dry hot countries.—In the "Horæ Societatis Entomologicæ Rossicæ," xxiv, pp. 233, 234 (1890), M. A. Wilkins, writing from Tachkent in Turkestan, alludes to the inefficiency of ordinary preservatives in Central Asia, on account of their rapid volatilization through the hot dry air, so that if a collection be neglected for only two or three months, *Anthreni* are sure to be found in the boxes. He has hit upon a plan which he finds effective, and at the same time very simple. He employs India rubber bands about 1½ inches in width, and less than the length of the boxes to which they are to be applied. These bands are stretched over the opening line of the boxes, and effectually prevent the entrance of the most minute destroyers. Possibly a similar plan might be adopted in other countries with a like climate. At any rate, the method has the merit of extreme simplicity.—EDS.

Newspaper Entomology.—The following is a cutting from the *Spalding Free Press* of March 3rd, 1891 :—

"*Remarkable discovery of a live butterfly,* 3000 *years old.*—Mr. —— of Crowland, believes he has discovered a peacock butterfly, at least 3000 years old. It came about in this way. Beneath a layer of gravel at Crowland, some 20 feet in thickness, was found a peat-bed, which at a moderate calculation would date back to 1500 B.C. Mr. —— was desirous of seeing the vegetable formation in this bed, and for this purpose cut out a brick of the peat. He then broke it open, and immediately a butterfly flew out. He captured it, and it lived in his establishment for about a fortnight afterwards. It is supposed that the butterfly was in the peat at the time the gravels were brought down, and thus sealed the bed. When the gravel was removed, the air penetrated the peat, and the process of incubation was set up; the breaking of the cake of peat admitting more air, promoted the final development of the butterfly, and it flew out. An indentation in the peat coincides with the existence of a chrysalis there, but the shell is lost. The peat and butterfly were exhibited before the Peterborough Natural History Society on Tuesday evening."

Coleoptera at Church Stretton.—In September last Dr. Horner and I spent a fortnight at Church Stretton, in Shropshire, with the object of working up the *Coleoptera* of that interesting locality. We were favoured with remarkably good weather, were able to devote the greater part of every day to collecting, and were rewarded with an amount of success beyond our expectations. To myself the district was not in any way strange, but to Dr. Horner all was quite new, and there could be no doubt about his thorough appreciation both of the beautiful scenery and of the entomological results of our expedition.

An entomologist visiting Church Stretton for the first time is at once impressed with its evidently favourable aspect for his special pursuit—its sub-mountainous surroundings, the high moorlands of the Longmynd on the west, the well-wooded hills of Helmeth, Ragleth, Haslar, Cardington, and Caer Caradoc, on the east, the delightful valleys, and the numerous streamlets which, flowing from the higher ground, feed the rivers Onny and Teme towards Ludlow.

The late Rev. W. Hope made this district famous in entomological annals by his records of remarkable captures at Netley, in this neighbourhood—a locality which is frequently confounded by entomologists of the present day with Netley near Southampton. A pretty full list of his discoveries could be compiled from Stephen's Manual of British *Coleoptera,* a still interesting (if obsolete) work, from reading which I first conceived an idea of the value and importance of the Church Stretton district as a field for entomological exploration; and although I have not found there all the species Mr. Hope discovered, a great many that seemed to have eluded him have rewarded my researches.

In my Catalogue of Midland *Coleoptera,* to be published shortly in the Transactions of the Birmingham Entomological Society, all the known Church Stretton species will be duly enumerated; but on the present occasion I purpose specifying only the rarer or more interesting of those captured during our recent visit.

In moss, on the margins of the hill-streams, and in waterfalls, we found *Chætarthria seminulum, Homalota eremita, H. curtipennis, H. decipiens, Gymnusa* *brevicollis, G. variegata, Quedius umbrinus, Q. auricomus* (abundant), *Q. attenuatus, Q. fumatus, Philonthus nigritulus, Stenus Guynemeri* (abundant), *Geodromicus nigrita, Parnus striatellus.* In the streams occurred *Hydroporus septentrionalis, H. rivalis*, and *H. Davisi.* Moss and dead leaves in woods produced a vast number of species, amongst which were the following :—*Lebia chlorocephala* (under broom), *Aleochara mærens, A. maculata* (5), *Oxypoda spectabilis, O. annularis, Ilyobates nigricollis, Homalota silvicola, H. crassicornis, H. pagana, H. pilicornis, H. valida*, ♀ (?), *H. macrocera, H. cadaverina, H. intermedia, H. testudinea, H. pilosiventris, Encephalus complicans, Megacronus cingulatus, M. inclinans, Mycetoporus lucidus, M. punctus, Habrocerus capillaricornis* (1, at World's End), *Euryporus picipes, Quedius nigriceps, Q. fumatus, Q. umbrinus, Q. scintillans, Medon brunneus, Deliphrum tectum, Homalium exiguum, Leptinus testaceus* (1), *Agathidium atrum, A. lævigatum, A. globosum, A. nigrinum, Amphicyllis globus, Choleva angustata, C. intermedia, C. spadicea, C. fusca, Colon dentipes, Neuraphes elongatulus, Bythinus puncticollis, B. validus, Bryaxis hæmatica, Gonioctena pallida, Liosoma oblongulum.* In fungi were captured :—*Homalota humeralis, H. oblita, H. indubia, Gyrophæna Poweri, Bolitochara lucida, Pocadius ferrugineus.* In shingle, on banks of streams :—*Perileptus areolatus, Homalota cambrica, H. longula, Philonthus fulvipes, Actobius signaticornis, A. prolixus*, and *Elmis parallelopipedus.* On a mossy bank at Netley we took *Homalota perexigua, Oxytelus Fairmairei, Neuraphes minutus, Scydmænus scutellaris*, and *Stilbus testaceus.* Under oak bark we found *Quedius puncticollis.* Altogether we must have taken about 200 species.—W. G. Blatch, Knowle, Birmingham : *March* 13*th*, 1891.

Odontæus mobilicornis at Wellington College.—Two specimens of this scarce insect were taken here on successive days in July last. They were found, one dead, the other alive, but both in good condition, floating on the surface of a small pond in the College grounds.—E. F. Elton, Wellington College, Berks : *March* 13*th*, 1891.

On the occasional development of wings in species of Hemiptera, usually micropterous or apterous.—In his new, thought-suggesting book, "The Darwinian Theory of the Origin of Species" (*cf.* p. 81, *ante*), at page 12, Mr. F. P. Pascoe says, "Some of our *Hemiptera—Nabis, Pithanus, Pyrrhocoris*, &c., ordinarily wingless, are sometimes found in hot summers to have well-developed wings." In all these species there are always, in their usual condition, at least rudiments of the elytra, but there are others commonly quite apterous, in which at times macropterous individuals appear, and then the respective forms are so different in aspect that they have been deemed to be distinct species, *e. g.*, *Velia currens* and *rivulorum, Mesovelia furcata* and *parva.* But I do not believe that such dimorphism happens only "in hot summers," for I have observed it also in cold seasons, and I may, in this connection, recur to a note published in 1869 (Ent. Mo. Mag., vi, p. 10), in which, referring to an abnormal appearance locally of many winged examples of *Velia currens* in April, 1868, I said, "What was the cause of the acquisition of wings by so many individuals ? There was nothing exceptional in the weather of 1867 to favour development—the insects appeared *before* the heat of 1868, and there have been no winged ones since, as might have been expected if heat influences full development ; so I apprehend the cause must be sought in other than external circumstances. At present, and, perhaps, for ever, if this be true, the cause of such irregular development must be hypothetical. In Nature there is always a reserve of power—a capability of replenishing exhausted force, and renewing action in one way or another. In insects we see this, for instance, in undeveloped bees and ants, the stage to which the ordinary workers attain being sufficient for the race; but if occasion arrive which requires a different condition of life, development is not arrested in so many individuals as usual—the reserve is brought forward. So it may be as to the development of wings in *Velia*—and doubtless in other insects—that the law of Infinite Wisdom, under which the creatures ordinarily exist without wings, has latent power for the production of these organs when they are to become necessary for the welfare of the race, either in removing the individuals to better localities, or in taking them to mingle with other stocks, and so prevent deterioration. I say, when the wings *are to become* necessary, for they must be prepared in the penultimate state, and the creatures can have no prescience or will of their own in providing for their unknown future."

I am very glad to see this interesting subject again brought under notice, and although it is admittedly difficult to investigate, I trust the consideration of it may result in bringing out some *fact* which may help towards its elucidation. At present, we may say, "*Omnia exeunt in mysterium.*"—J. W. DOUGLAS, 153, Lewisham Road, S.E.: *March 9th*, 1891.

Hepialus velleda in abundance in Somerset.—Mr. Bidgood, Curator of the Taunton Museum, informs me that some years ago two young collectors living in West Somerset, near the border of Exmoor, brought to him considerable numbers of *Hepialus velleda*, which they had taken in the Exmoor district. Some of these were in the Museum collection. I have not previously heard of this species *in abundance* in the south or south-west, although casual specimens have often been recorded.—CHAS. G. BARRETT, 39, Linden Grove, Nunhead: *March*, 1891.

Hesperia lineola in Somerset.—When at Taunton a few weeks ago I looked over a small collection of *Lepidoptera*, and found in the short series under the name of *Hesperia linea* two specimens of *H. lineola*. These specimens were previously unrecognised, but were almost certainly taken in Somersetshire, and the species evidently has a wide range with us.—ID.

Black variety of Phigalia pilosaria at Gainsborough.—My friend Mr. M. F. Burton, of Gainsborough, recently captured a black variety of this species in a wood near Gainsborough, and wrote to me as follows concerning it:—"I found it on the bole of an oak on February 15th; it was a rich velvety-black all over, except the lines on the upper wings, which were brown. It was one of the most beautiful insects I ever met with, but was much injured by a collector to whom I gave it, who killed it with ammonia, and allowed its wings to get rubbed. It is now in my possession, and I much regret I ever parted with it. I occasionally meet with black varieties of *A. betularia* here—all females." Mr. Burton informs me that *Ph. pilosaria* was exceedingly abundant in the wood on the day above mentioned, and that he saw another very dark, but not black, variety. — W. W. FOWLER, Lincoln: *March 14th*, 1891.

Note concerning Pseudomacromia elegans and pretiosa, Karsch.—In the current number of the "Entomologische Nachrichten" (1891, Heft. v.), Dr. Karsch describes two magnificent dragon-flies, under the above names, from Cameroons. I have had these two species in my collection for several years, discovered in the same district by the late Mr. D. G. Rutherford, and have readily identified them by Dr. Karsch's excellent descriptions. But Dr. Karsch places them in two different sections, thus :—

a. Hind-wings with no inner triangle .. ...*Ps. speciosa.*
b. ,, ,, an ,, ,, ...*Ps. pretiosa.*

I possess two ♂ of *Ps. speciosa* : in one the inner triangle is *present* in both hind-wings ; in the other it is *absent* in both hind-wings.

I have one ♀ of *Ps. pretiosa* : the inner triangle is *present* in both hind-wings, and in the right hind-wing there is an additional nervule.

It appears to me that this character is seldom of *strict* sectional value in *Libellulina*, and is only of importance when studied from a large number of individuals of a species.

Ps. pretiosa is one of the most handsome of the *Libellulina.* It is strange that both Dr. Karsch and myself should have seen only the ♂ of one species and the ♀ of the other ; but I can hardly consider this (perhaps mere coincidence) suggestive.—R. McLachlan, Lewisham : *March 16th*, 1891.

Anthophora pilipes at Ilfracombe.—After the very severe winter which we have had it may be worth recording that *Anthophora pilipes*, ♂, was enjoying itself in the sun here on the 28th February. I saw two males, one of which allowed me to catch it in my fingers ; I do not think this is unusually early in normal years, but this has not been a normal winter, and in a place like this, which is not generally at all an "early" one, I was surprised to see them. I fear the snow storm of this week must have equally surprised them, and prevented further enjoyment, at least for some time.—Edward Saunders, Ilfracombe : *March 13th*, 1891.

Note on some Irish Trichoptera.—When looking over some *Trichoptera* collected by the Rev. W. F. Johnson near Armagh, I noticed one female of *Grammotaulius atomarius*, F., an insect which has not been recorded for Ireland. In the same box there was an insect which is now being turned up more frequently, namely, *Molanna palpata*, McL. From the same neighbourhood there was also *Limnophilus affinis*, Curt., *Holocentropus picicornis*, Stc., and *Plectrocnemia conspersa*, Curt. *Chimarrha marginata*, L., occurred in considerable plenty near Bundoran.—James J. F. X. King, Glasgow : *March*, 1891.

Obituary.

It is with regret that we announce the death of *Dr. J. M. J. af Tengström* whose work on the *Micro-Lepidoptera* of Finland, "Bidrag till Finlands Fjäril-Fauna," published in 1847, in the "Notiser Sällskapets pro Fauna et Flora Fennica Förhandlingar," placed him at that early date in the foremost rank of the Micro-Lepidopterists of Europe.

Twelve years later appeared in the publications of the some Society his "Anmärkningar och Tillägg till Finlands Småfjgäril-Fauna."

Up to that time Dr. Tengström had lived at Helsingfors, a comparative centre of learning and civilization, but he then moved to the remote Kexholm, on an island in the large Lake Ladoga, where he was comparatively out of the world.

He died on December 26th, 1890, at the age of 69.

Review.

THE MESOZOIC AND TERTIARY INSECTS OF NEW SOUTH WALES: by R. ETHERIDGE, Jun., and A. SIDNEY OLLIFF; from the Memoirs of the Geological Survey of New South Wales. Palæontology, No. 7; pp. 1—12, 4to, with two plates. Sydney, 1890.

The knowledge of Fossil Insects has made gigantic strides latterly, more especially in France, Germany and North America; important discoveries have also been recently made in our own islands. But, as the authors of this Official Report tell us, the fossil insect remains previously known from Australia were quite insignificant in number, and, until recently, the oldest was of the Cretaceous horizon, viz., a Dragon-fly from Queensland described by Dr. H. Woodward as *Æschna flindersensis*. The others (with one exception) were Tertiary. Nor is the number of Australian fossil insects very largely increased by those made known in this memoir; nevertheless, very important additions are made, and a substantial nucleus now exists around which to accumulate further discoveries, which, probably, have not yet been made, not because there is but little to discover, but because little or no attention has hitherto been paid to the subject.

In the present memoir a single mesozoic fossil from New South Wales is described and figured as *Cicada Lowei*, but another from Queensland is also described, in the remains of a Buprestid, showing the elytral sculpturing in a very perfect manner.

The Tertiary remains, newly discovered, are more numerous. They include *Chironomus venerabilis* (*Diptera*); *Ephemera Culleni (Pseudo-Neuroptera)*, a May-fly, of which several nymphs are figured, the single wing is of somewhat anomalous form, and is detached from the body to which it is presumed to belong (Pl. i, fig. 5); and a presumed Lampyrid larva *(Palæolycus problematicus)*, this should be further investigated.

A summary of the known Australian Fossil Insects gives the following small results. Mesozoic: a *Cicada* and a Buprestid. Cretaceous: a Dragon-fly. Tertiary: *Cydnus*, *Chironomus*, *Ephemera*, *Lagria* (?), Lampyrid, *Cyphon*, and *Oxytelus*; one of each. The authors express a not unreasonable surprise at the absence, at present, of any indications of Palæozoic insect remains.

Societies.

BIRMINGHAM ENTOMOLOGICAL SOCIETY: *February 16th*, 1891.—Mr. R. C. BRADLEY in the Chair.

Messrs. C. J. Fryer, Warwick, and A. Madeley, Dudley, were elected Members of the Society.

Mr. R. C. Bradley showed *Ephenella marginata* from Bournemouth. Mr. E. C. Tye read a paper (written conjointly with Mr. G. W. Wynn) on the *Lepidoptera* of Marston Green; it was written with the purpose of showing what might be done in that district rather than what had been done; and to recommend members to work it, as it lies very near to Birmingham, and is easily got at. The paper described the ground, which includes Packington Park and many fine woods and lanes, and also gave a list of species already taken there.

March 2nd, 1891.—Mr. R. C. BRADLEY in the Chair.

Mr. J. J. Quirke, Jun., Handsworth, was elected a Member.

Mr. R. C. Bradley showed *Trypeta centaureæ* from Moseley. Mr. G. H. Kenrick showed a specimen of *Triphæna pronuba*, bred this January from eggs found on a withered lime leaf early last September. Mr. Kenrick read a paper on "Temperature: its effects on some insects not found in this district." He pointed out the great importance of temperature in affecting the distribution of insects; he said that most insects were very susceptible to heat or cold during some period of their existence, which period varies in different species; and that a difference of a few degrees would kill them off or prevent their development. He quoted a number of species in illustration, showing how their distribution was affected by various temperatures. He believed that this extreme susceptibility often assisted evolution very materially by isolating species. The paper was illustrated by some admirable maps and specimens of the species treated of.—COLBRAN J. WAINWRIGHT, *Hon. Sec.*

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY.—The Monthly Meeting was held on Monday, February 9th, 1891, the President (Mr. S. J. CAPPER, F.L.S., F.E.S.) in the Chair.

Mr. W. E. Sharp read a paper on "Variation and Heredity." The President exhibited varieties of *Bombyx rubi*. Mr. Gregson, a variety of *Sciaphila Colquhounana* bred from larvæ collected at Scarlet Rocks, Isle of Man, 1889. Mr. R. Newstead, a specimen of *Vanessa Antiopa* captured in Cheshire in 1872. Mr. Stott, varieties of British *Lepidoptera*. The Rev. H. H. Higgins, African Butterflies. Mr. Wilding, a series of *Silpha atrata*, var. *subrotundata*, from Ireland.

Monday, March 9th, 1891.—The President in the Chair.

Mr. Brocton Tomlin was elected a Member. Messrs. Collins, of Warrington, and Scowcroft, of Prestwich, were proposed for Membership.

Mr. J. Herbert Stott read a paper on "A parasitic fungus forming its base in the larva of a New Zealand Lepidopteron," illustrated by specimens and drawings. The Hon. Sec., F. N. Pierce, read a paper, entitled, "Notes on the Genital Armature of the genus *Miana*," in which he referred to the recent controversy respecting the distinctiveness of the two species, *M. strigilis* and *M. fasciuncula*, and proved, by the examination of the structure of the genital armature, that they were specifically different; the paper was illustrated by the author's preparations, thrown on a screen by the aid of the oxy-hydrogen Micro lantern, and exhibits of specimens from various parts of the country by the President and Members.—F. N. PIERCE, *Hon. Sec.*

N.B.—Meetings on Second Monday in each month, at the Free Library, William Brown Street, Liverpool, at 7.30 p.m.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY: *February 26th*, 1891.—W. H. TUGWELL, Esq., President, in the Chair.

Mr. R. J. Anderson, of Suez, was elected a Member.

Mr. Adye exhibited an unusually dark form of *Notodonta camelina*, L., with other forms of the same species. Mr. Cockerell, *Heliothis armigera*, var. *umbrosa*, Grote, from the West Mountain Valley, Colorado. Mr. H. Moore exhibited *Erebus odora*, from South America. Mr. Turner, *Melanippe fluctuata*, L., taken at Brockley; the specimens were very variable. Mr. R. Adkin then exhibited long series of the species of the genus *Triphæna*, Och., from many localities in the British Islands, together with Continental series of some of the species for comparison. In dealing with *comes*, he pointed out Hübner's typical form, the varieties *adsequa* and *prosequa* of Treitschke, and *Curtisii* of Newman, also Hübner's *consequa*, which he considered should be regarded as a form of this species rather than of *orbona*, Hufn., to which it had hitherto been referred, and supported his contention by specimens known to be forms of *comes*, Hb., which agreed with Hübner's figure of *consequa*. He also described the distinguishing characters of these varieties, and gave notes on the nomenclature of the species. Mr. Fenn exhibited examples of the genus *Triphæna*, from Forres. Mr. McArthur, *T. comes* from the Isle of Lewis, and *T. ianthina* from Northumberland. Mr. Turner, *T. pronuba* from Brockley, Kent. Mr. South and Mr. Tugwell also showing varieties of various species of the genus. A discussion followed, Messrs. South, Fenn, Tugwell, Adkin, and others taking part. Mr. E. Step exhibited a hibernating specimen of *Vespa germanica* (♀).

March 12th, 1891.—The President in the Chair.

Mr. E. F. Elton, M.A., of Wokingham, was elected a Member.

Mr. R. Adkin exhibited *Pœdisca Solandriana*, L., bred from larvæ feeding in shoots of birch from Aberdeen, and, on behalf of Mr. W. Smith, sundry Tortrices and Crambites from Paisley. Mr. R. South, *Vanessa urticæ*, L., from various parts of the world, to show the geographical distribution and local variation. Mr. Adye, varieties of *Abraxas grossulariata*, L., from Hants. Mr. Robinson, two specimens of *Pygæra*, which had been supposed to be varieties of *P. curtula*, L., and were bought quite cheap in 1876. Mr. Tugwell said it was difficult to say what the species was. Mr. T. R. Billups exhibited a large number of Hymenopterous and Dipterous parasites, and communicated a paper thereon.—H. W. BARKER, *Hon. Sec.*

ENTOMOLOGICAL SOCIETY OF LONDON: *March 4th*, 1891.—The Right Hon. Lord WALSINGHAM, M.A., F.R.S., Vice-President, in the Chair.

Mr. F. P. Pascoe exhibited, and made remarks on, a curious Coleopterous larva with a case somewhat resembling that of the Lepidopterous genus *Psyche*, which was found at the Theatre of Bacchus, Athens.

Mr. J. W. Douglas sent for exhibition specimens of *Icerya* (*Crossotosoma*) *ægyptiaca*, which, through the kindness of Mr. A. D. Michael, he had received from Alexandria on the 19th January last. It was stated that in travelling most of them had become loose, and had lost their waxen appendages ; but a few still remained on the stems of their food-plant. In connection with this subject, Mr. G. H. Verrall alluded to a Dipterous parasite of *Icerya* from Adelaide—*Lestophonus iceryæ*, Williston,—which had been bred form *Icerya Purchasi*, Mask., last February. Mr. McLachlan and Lord Walsingham continued the discussion.

Mr. R. Adkin exhibited a long and interesting series of *Triphæna comes* (*orbona*), from various parts of the South of England, Yorkshire, Forres, the Isle of Man, the Isle of Lewis, and the North of Ireland.

Mr. G. F. Hampson exhibited a series of varieties of *Plotheia frontalis*, Walk., which was the only species in the genus, and confined to Ceylon. He said that the varied forms of this species had been described under twenty-one different names by Walker, Felder, and Moore.

Mr. F. Merrifield showed a number of specimens of *Selenia illustraria*, of three different stocks, proving that the spring brood of this species, which passed the winter in the pupal stage, was, like the summer pupa, materially affected in colouring by the temperature to which the pupa had been exposed in its later stages. He thought this fact, coupled with similar results ascertained with respect to the single-brooded *Ennomos autumnaria*, indicated that the operating cause was one of wide general application, and that valuable results might be looked for if entomologists would turn their attention to the subject. Mr. H. J. Elwes said that in his experience in many parts of the Palæarctic region, in Japan, in the Taurus Mountains, on the north-eastern part of the Mediterranean, in the Canary Islands, and elsewhere, where there was a combination of heat and moisture, all the commoner species of *Lepidoptera* occurring in this country attained a larger size and a greater brilliancy of colouring than in colder and drier regions ; and he referred to such species, amongst others, as *Pieris brassicæ* and *Argynnis Paphia*. The discussion was continued by Mr. Jacoby, Mr. Fenn, and others.

Mr. W. H. B. Fletcher exhibited a long series of *Zygæna lonicerœ* from York, and *Zygæna filipendulæ* from Shoreham, Sussex ; also a series of hybrids obtained by crossing these two species. He stated that the eggs obtained from these hybrids were all infertile. Lord Walsingham said this latter fact was extremely interesting.

Mr. F. W. Frohawk exhibited a living specimen of an ichneumon which had just emerged from a chrysalis of *Papilio Turnus*.

Mr. C. J. Gahan exhibited a number of species belonging to the genera *Lema* and *Diabrotica*, and read a paper on them, entitled, "On mimetic resemblances between species of the Coleopterous genera *Lema* and *Diabrotica*." Lord Walsingham, Mr. Jacoby, Colonel Swinhoe, and Mr. Champion took part in the discussion which ensued.—H. Goss and W. W. Fowler, *Hon. Secretaries.*

SYNOPSIS OF THE GENUS *SCOLOPOSTETHUS.*

BY G. HORVÁTH M.D.

In vol. xxv of this Magazine, Messrs. James Edwards and Edward Saunders have published several papers on the British species of the genus *Scolopostethus*, Fieb. The two authors do not agree on the subject, and whereas Mr. Edwards indicates six British species, of which two are new, Mr. Saunders does not admit more than four.

As Mr. Saunders has had the kindness to send me authentic specimens of the species established by Mr. Edwards, I have also looked into this controverted question. In publishing here the result of my researches, I take the opportunity to give a synoptical table of all the European species of the genus.

I entirely agree with Mr. Saunders that one must not attach a high specific value to the colour of the antennæ in this genus. The ♂ genital styles would be good guides, but they are difficult to examine, and therefore the characters derived from them are hardly available practically; at the same time I think that there are other characters which one can well employ to distinguish the species; these characters have been originally partly indicated by C. G. Thomson, and have reference to the structure of the antennæ, of the anterior legs, of the mesosternum, &c.

The pubescence of the upper surface allows us to separate off one section of the species.

Among the species which are glabrous above, *pictus*, Schill., is easily distinguished by the slender antennæ and by the structure of the anterior femora, of which the tooth is central.

cognatus, Fieb., from South Europe, is easily known by the red-brown tint of its general colour, the white base of the corium with concolorous punctures, and the ferruginous apical joint of the antennæ.

brevis, Saund., from Malta, should have the antennæ somewhat similar; unfortunately the unique type was lost in the post, so one cannot pronounce any certain opinion upon it, but, to judge from Mr. Saunders' short diagnosis, I think it ought to be referred to *cognatus*, Fieb.*

Having thus disposed of the above mentioned species, there only remains a small group of the genus to be examined, which contains just the species about which Messrs. Edwards and Saunders disagree. It is quite certain that the mesosternal tubercles in this genus possess the same real value as in the allied genus, *Eremocoris*, Fieb.

We have two species with mesosternal tubercles: the one is the *affinis* of

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* It is now known that the curious *Tritomacera aphanoides* of Prof. A. Costa is also only a specimen of this species with monstrous antennæ. I possess a similar abnormal example of *S. Thomsoni*, Reut., of which both antennæ have only three joints.

Schilling; the other is the species which has been named *punctatus* by Mr. Edwards, but which I described ten years ago under the name *grandis* (Term. Füzetek, 1880, p. 185, 4).

Mr. Saunders does not believe in the distinctness of this species, and considers it only as a variety of *affinis*. If one only consulted the description given by Mr. Edwards, one would willingly accept this view; but, on examining the types, one can prove to oneself easily that it is a good and very distinct species. It differs from *affinis* by its larger size, the structure of the pronotum, and the development of the membrane in the brachypterous forms. One might say that the development of the membrane is intermediate between that of the brachypterous and that of the macropterous form of *affinis*. This species, described by me from Hungary and by Mr. Edwards from *Britain*, is probably distributed over the whole of Europe.

Let us now examine the remaining species with the mesosternum simple.

Mr. Edwards records three species, *adjunctus*, D. & S., *neglectus*, Edw., and *decoratus*, Hahn.

As to *adjunctus*, D. & S., Mr. Saunders has shown that it is an insect with tuberculated mesosternum, and identical with *affinis*, Schill. My friends, Dr. Puton, Reuter, as well as myself and Mr. Edwards too, have been deceived in considering the *adjunctus*, D. & S., to be a species without tubercles; the species named by us erroneously *adjunctus* is really *Thomsoni*, Reut. (*decoratus*, Thoms., *nec* Hahn), of which the *neglectus*, Edw., seems to me to be only an insignificant variety with the first two antennal joints partly black; at least, I cannot find in it any character of specific value. The colour of the antennæ is in this species variable, and the black colour tends to develop more or less. Specimens with the 1st and 2nd joints of the antennæ entirely testaceous are very common in Transcaucasia, but are less frequent in Europe.

Decoratus, Hahn (*ericetorum*, Leth.), differs from the preceding by the structure of the pronotum, which is shorter, more transverse, with the lateral margins a little straighter, the coloration as a whole is more obscure, and the antennæ are generally black, the membrane is nearly always complete.

According to my investigations there should be five species of *Scolopostethus* in Britain.

1. *pictus*, Schill.
2. *grandis*, Horv., = *punctatus*, Edw.
3. *affinis*, Schill., = *adjunctus*, D. & S.
4. *Thomsoni*, Reut., = *adjunctus*, Edw., and *neglectus*, Edw.
5. *decoratus*, Hahn.

The European fauna possesses altogether nine species of this genus, which may be distinguished by the following table:—

1 (12) Pronoto, scutello hemelytrisque glabris.

2 (3) Antennis gracilibus, corpore dimidio longioribus; dente majusculo femorum anticorum in medio sito; vertice inter oculos pilis duobus longioribus

erectis anterioribus instructo, posterius prope ocellos pilis destituto. Mesosterno mutico; antennis totis flavo-testaceis vel raro (var. *antennalis*, Horv.), articulis duobus apicalibus saltem ad partem nigris. Long., 4½ mm. Europa fere tota; Transcaucasia ....1. *S. pictus*, Schill.

3 (2) Antennis crassiusculis, brevioribus; dente majusculo femorum anticorum ante medium, fere in triente anteriore sito; vertice pilis erectis nonnullis longioribus etiam posterius prope ocellos instructo.

4 (11) Articulo quarto antennarum toto nigro, raro basi pallido; corio griseo-testaceo, fusco-punctato, pone medium nigro-maculato.

5 (8) Mesosterno ante coxas bituberculato; tibiis anticis apud mares fortiter apud feminas leviter curvatis.

6 (7) Statura majore; pronoto etiam in exemplis macropteris fere quadrato, æquilongo ac basi lato, antrorsum haud angustato; membrana apicem abdominis raro attingente, plerumque plus minusve abbreviata, sed pone angulum apicalem corii fortiter rotundato-producta, parte hac producta dimidio diametri membranæ circiter æquilonga; articulo secundo antennarum apicem versus sæpe nigro vel nigro-fusco. Long., 4½ mm. Britannia, Hungaria .... 2. *S. grandis*, Horv.

7 (6) Statura minore; pronoto in exemplis macropteris trapezoideo, antrorsum distincte angustato; membrana rite explicata vel abbreviata, in hoc casu apice rotundato-truncata et pone angulum apicalem corii vix producto; articulo secundo antennarum toto flavo-testaceo. Long., 3½—4 mm. Europa tota; Transcaucasia; Sibiria occidentalis 3. *S. affinis*, Schill.

8 (5) Mesosterno simplici; tibiis anticis apud mares leviter curvatis, apud feminas basi rectis.

9 (10) Pronoto longiore, basi minus quam duplo latiore, marginibus lateralibus sinuatis; articulis primo et secundo antennarum flavo-testaceis, illius basi et hujus apice sæpissime nigris; membrana abbreviata vel raro completa. Long., 3½—4 mm. Europa septentrionalis et media; Transcaucasia ....4. *S. Thomsoni*, Reut.

10 (9) Pronoto brevi, transverso, postice fere duplo latiore quam longiore, lateribus fere rectis; antennis plerumque totis nigris, tantum apice articuli primi basique articuli secundi testaceis; membrana completa, rarissime abbreviata. Long., 3½—4 mm. Europa fere tota; Asia minor; Transcaucasia.
5. *S. decoratus*, Hahn.

11 (4) Articulo quarto antennarum, basi nigra excepta, ochraceo; dimidio basali corii lacteo, punctis decoloribus, dimidio apicali fusco-cinnamomeo, macula costali pone medium lactea. Mesosterno mutico. Long., 3½—4 mm. Europa meridionalis ....6. *S. cognatus*, Fieb.

12 (1) Corpore superne piloso. Mesosterno mutico; articulis duobus apicalibus antennarum nigris.

13 (16) Pilis superficiei corporis semierectis et sat dense dispositis; membrana in exemplis brachypteris minus abbreviata, pone apicem corii rotundato-producta, parte hac producta dimidio diametri membranæ fere æquilonga vel longiore.

14 (15) Superne breviter pilosus, tantum vertice pilis nonnullis erectis pilis reliquis duplo longioribus instructo; scutello apice imo ferrugineo; corio griseo-testaceo, apice nigro-fasciato; membrana completa, apicem abdominis attingente vel sæpius abbreviata, segmentum dorsale ultimum abdominis haud tegente; articulis duobus basalibus antennarum totis flavo-testaceis; femoribus anticis, basi apiceque exceptis, nigris. Long., 3½—4 mm. Hungaria; Austria meridionalis .... 7. *S. puberulus*, Horv.

15 (14) Superne longius pilosus, pilis verticis pilis reliquis haud longioribus; scutello toto nigro; corio ferrugineo-testaceo, apicem versus tantum nigro-marginato; membrana abdomine paullo breviore vel rarissime paullo longiore; articulo secundo antennarum apice nigro vel nigricante; pedibus totis testaceis. Long., 3½—4 mm. Hungaria; Rossia meridionalis; Transcaucasia.................. ....8. *S. Lethierryi*, Jak.

16 (13) Corpore superne pilis præsertim in corio perpendiculariter erectis longis minus dense vestito; membrana abbreviata pone apicem corii levissime producta. Scutello apice ferrugineo; corio griseo-testaceo, apice nigro-fasciato; articulo secundo antennarum apice sæpissime, femoribus anticis medio semper nigris. Long., 3½—4 mm. Suecia, Gallia, Germania, Austria, Hungaria; Sibiria occidentalis..... ....9. *S. pilosus*, Reut.

There are yet two species of the genus—*S. maderensis*, Reut., from Madeira, belonging to the section in which the species are hairy above; and *S. abdominalis*, Jak., from Mongolia, allied to *pictus*: as I have seen neither the one nor the other, I am unable to include them in my table.

Budapest: *February* 28*th*, 1891.

VARIATION OF *APOROPHYLA AUSTRALIS* AT PORTLAND.

BY NELSON M. RICHARDSON, B.A.

Mr. C. G. Barrett, in looking over my collection a short time ago, seemed to admire very much amongst other things my Portland series of *A. australis*. My acquaintance with this species is not large, but I have always thought that the Portland specimens were very handsome, and presented a great contrast to several I received from Surrey, amongst which there was but little variation, and which looked rather dingy beside the Portlanders. It is difficult for entomologists living in rather remote localities to be very well up in the forms of species found in other parts, and the advent of a friend who has more opportunities of seeing other collections generally gives them some new ideas.

I have never seen *A. australis* common at Portland, and do not think that I have met with more than 20 or 25 in four seasons, in-

cluding worn ones. On the night on which I took the largest number (6 or 7) the lanterns had gone out for want of oil (I have since then always carried a reserve bottle), but fortunately for our personal safety there was a bright moon, by the light of which I boxed my *australis* on the ivy blossom. Had it been dark we must have remained where we were, amongst the rocks, until daylight.

Occasionally a specimen occurs at Portland like the Surrey ones, but generally the ground colour in the ♂ is whiter, which gives the insect a cleaner appearance. The ♀ does not, so far as I have seen (3 or 4 specimens), deserve much special notice, though it partakes, to a slight extent, of the striking characters of the ♂. In one ♂ the chalky-white ground-colour is strongly contrasted with the sharp black markings, the most conspicuous of which are a blotch between the stigmata and another following the reniform, a large blotch half-way between the stigmata and the inner margin, two blotches on the inner margin, the usual basal and hind marginal streaks, and the zigzag lines which bound the central area. The centre of the thorax is white with a black streak, and each patagium has the upper part white and the lower part nearly black.

In another ♂ all these black markings are indicated slightly, but as a rule sharply, in black, with very faint brown patches in the neighbourhood of the stigmata and hind margin, and the ground-colour (of which much more is visible than in the first specimen) is likewise pure white. A third is like No. 2, but has the black markings somewhat more developed, and a fourth (a great contrast to No. 2) is suffused with blackish clouds all across the middle part of the wing. The hind-wings of the male are very pale, especially in some specimens, but not quite so white as the fore-wings.

There are other intermediate forms with dark clouding on the costa, but I think that I have said enough to show what the species is like in this locality. My desire is to breed it, but I was unsuccessful with the only eggs that I managed to procure—an elastic band broke and the larvæ escaped. I took no females last year, and only two or three males, though I was at Portland several times during the autumn, twice in the company of my very energetic friend, Mr. H. W. Vivian, who induced me to take him there two nights running, which is rather much, even for an entomologist, considering that we spent one of the days there as well, and did not get home until from 4 to 5 o'clock a.m.

Monte Video, near Weymouth:
March 14*th*, 1891.

DESCRIPTION OF THE LARVA OF *EUPERIA FULVAGO.*

BY GEO. T. PORRITT, F.L.S.

For many years Sherwood Forest in Nottinghamshire was considered the only British locality where this pretty species could be taken in numbers. There it used to be, and I suppose still is, a most abundant moth. Odd specimens were very occasionally taken in other and very widely separated localities in England and Scotland, but it was not until 1888, when Mr. J. N. Young, of Rotherham, and his friends, took twenty-six specimens in Wadworth Wood, near Doncaster, that another locality was found where it could be relied on to occur in some plenty, as the two seasons which have elapsed since then have sufficiently proved.

By previous arrangement, I met Mr. Young in Wadworth Wood on the 21st of June last, and found that by the time I arrived he had already made a good haul of *Euperia fulvago* larvæ, along with many other species He had gone the previous evening to "sugar," remained in the Wood all night, and commenced to beat for larvæ at daybreak. We set to work together at the birches, and I had before long the satisfaction of finding that the "early bird" had not got quite all "the worms," for by the time I discontinued beating, a fair number had found their way into my boxes. We were, however, clearly a week too late, as although a few larvæ were small, by far the greater part were quite full-fed, and evidently most had already left the trees.

The full-grown larva is about an inch and a half in length, and of moderate bulk in proportion; head very slightly narrower than the 2nd segment, the lobes round and polished; body cylindrical, and of nearly uniform width throughout; skin soft, and so translucent that the pulsations of the internal vessels can be distinctly seen through it.

Ground-colour pale dingy green, with the appearance of having been dusted over with a white powder; head pale yellow, the mandibles black, and on each side, a little above the mandibles, and towards the outside, is a small red spot; medio-dorsal and subdorsal lines white; the spiracular stripe is composed of two waved lines, also white; this stripe encloses the spiracles, which are white, edged all round with purple; segmental divisions yellow, this colour showing especially when the larva is crawling.

Ventral area and prolegs uniformly pale dingy green, the anterior legs still paler, and slightly tipped with black.

The young larvæ found did not appear to differ either in shape or colouring from the adult specimens.

Feeds on birch, and rests coiled round in the middle of a leaf with the head close to the other extremity, just as does the larva of *Cymatophora flavicornis* when full-grown.

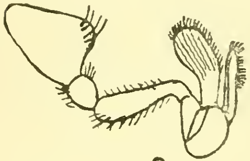
The larvæ all pupated below the surface of the earth in their cage, and the moths emerged from July 25th to August 4th.

Huddersfield: *April 7th*, 1891.

ON THE FORM OF THE MAXILLÆ IN CERTAIN EUROPEAN SPECIES OF THE GENUS *MORDELLA*.

BY G. C. CHAMPION, F.Z.S.

In the European species of the genus *Mordella*, including the British *M. aculeata*, Linn.,[*] the type of the genus, and *M. fasciata*, Fabr., the maxillæ vary in shape to an extraordinary degree, according to the species. This character appears to have escaped the observation of such accurate observers as Lacordaire, Mulsant, Emery, and others. The extreme forms are well seen in *M. aculeata* and *M. fasciata*, of which, and of *M. sulcicauda*, Muls., I have dissected out the mouth-parts of numerous examples of both sexes. In *M. aculeata*, the outer ciliated lobe of the maxilla is exceedingly long and linear, riband-like, tapering to a point, the inner lobe being also long and slender (fig. 1); the outer lobes project, tongue-like, far beyond the front of the head, and are easily seen without dissection. This is the form represented by Jacquelin-Duval (Gen. Col. Europ., iii, t. 90, fig. 447, *bis*), and given by him (*op. cit.*, pp. 405, 406) amongst the generic characters of *Mordella*: "mâchoires à lobes lamelliformes coriacés; l'externe très-étroit, linéaire, presque aussi long que le palpe, très-obtusément coudé en dehors avant son milieu, atténué au sommet, très-brièvement cilié; l'interne aussi étroit, mais atteignant à peine au coude de l'externe, détaché à sa base, densément cilié en dedans à l'extrémité;" but by some mistake the maxilla figured is attributed to *M. fasciata*. In *M. fasciata*, the outer ciliated lobe is short and comparatively



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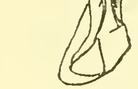

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[*] In the Rev. W. W. Fowler's work on the British *Coleoptera*, v, p. 69, the locality, "Westerham, Kent, frequent (*Gorham*)," is given amongst others for this very rare British species, but this probably refers to *M. fasciata*, Fabr., and not to *M. aculeata*. The latter is very widely distributed and common on the continent, from Scandinavia to the Mediterranean region, occurring on high mountainous ground, as well as on the warm southern shores of Europe, and ought to be found more frequently in Britain. I have only seen it alive myself in Norway, but possess examples from Switzerland, Gibraltar, various places in the Mediterranean region, Asia Minor, &c.

broad, rounded at the apex, and is not visible beyond the front of the head (fig. 2).

In the S. European *M. sulcicauda*, the outer lobe is nearly as long as it is in *M. aculeata*, the insect in other respects closely resembling *M. fasciata*. In *M. bipunctata*, Germ., it is a little shorter. In *M. 12-punctata*, Rossi, *M. maculosa*, Naez., *M. bisignata*, Redt., and *M. villosa*, Schr., so far as can be ascertained without dissection, the outer lobe is short, though in one or two of them, *M. 12-punctata*, &c., the tips are visible beyond the front of the head, and in this respect these last-mentioned species are intermediate between *M. bipunctata*, and *M. fasciata*. This lobe does not vary in length according to the sexes, it being similar in both. Jacquelin-Duval's figure (447, *bis*) no doubt represents the maxilla of *M. aculeata*, or of *M. sulcicauda*. Mulsant, in his voluminous work on the "Longipèdes," omits all mention of these characters; and Emery, "Essai Monographique sur les Mordellides," p. 4, nota 1, doubts that any species of the genus *Mordella* has a lobe like that figured by Jacquelin-Duval: "La fig. 447, *bis*, de Jacquelin-Duval, qui représente la mâchoire de la *Mordella fasciata*, est certainement inexacte. *Une mâchoire pareille n'existe ni dans la M. fasciata, ni dans aucune autre Mordelle que j'aie disséquée*" (the *italics* are mine). Yet Emery (*op. cit.*, p. 78) notices a variable character of this kind in *Mordellistena*, where it is not nearly so easily seen, owing to the smaller size of the species.

In the very long and linear outer lobe of the maxilla, *M. aculeata* and *M. sulcicauda* approach the genera *Rhipiphorus* and *Nemognatha*, in which this character is still more developed. I have not yet observed a linear form of maxilla amongst any of the large number of tropical American *Mordellæ* I have examined, all these approaching *M. fasciata* in this respect.

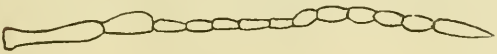
11, Caldervale Road, Clapham, S.W.:
March 12th, 1891.

MALE AND WORKER CHARACTERS COMBINED IN THE SAME INDIVIDUAL OF *STENAMMA WESTWOODI*.

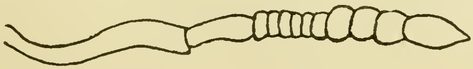
BY R. C. L. PERKINS.

Last October, while walking between Dartmouth and Stoke-Fleming, I picked up a small ant, which was moving in a very uncertain and erratic man-

♂



♀



ner. Subsequent examination showed it to be a monstrosity of the above named species; the right half of the body exhibiting characters strongly characteristic of the ♂, while the left half resembles the ☿.

The following is a description of the two halves, drawn up in parallel columns for comparison.

LEFT HALF.	RIGHT HALF.
Head red, with darker cloud reaching from vertex to eye.	Head dark brown.
Mandible very large, with 7 teeth.	Mandible small (the ant being carded I cannot clearly make out the form of the right mandible).
Antenna 12-jointed, testaceous, with pale hairs; 1st joint of flagellum longer than next two together; these and the following joints much wider than long; apical joint very large and stout, as long as two preceding; scape very long and bent, as long as many joints of flagellum.	Antenna 13-jointed, dark, thin, with pale hairs; 1st joint of flagellum stouter than next, but subequal to it; the following joints all much longer than wide; apical joint as long as on left side, but not nearly so stout; scape short and straight, only about as long as two joints of flagellum, and *per se* barely half the length of that of left side.
Eye small.	Eye larger; more than twice the size of the other, and much nearer to the base of antenna.
Mesothorax red.	Mesothorax dark, laterally with two rough projections, apparently *tegulæ*.
Second node of petiole lighter.	Second node of petiole darker.
Abdomen from middle line testaceous-brown.	Abdomen from middle line dark brown.
Legs shorter and thicker.	Legs longer and thinner.

The form of the abdomen, so far as I can make out in this specimen (set on card) is that of the ☿. The shape of the mesothorax is unsymmetrical bilaterally. Length, about 3 mm.

DESCRIPTION OF FIGURES.

A, right, B, left, antenna, viewed from the side (enlarged).

In the "Entomologist's Annual," 1874, F. Smith describes an anomalous specimen of *Myrmica lævinodis*, having the right side entirely ☿, but the left side partly ♂, partly ♀; while in my *Stenamma* the right side is ♂, the left ☿. I am indebted to Mr. Saunders for the reference to the Annual.

Sopworth Rectory, Chippenham:
March, 1891.

ANNOTATED LIST OF BRITISH *TACHINIDÆ*.

BY R. H. MEADE.

(*continued from page* 94.)

6.—GERMARIA, Dsv.

Gen. ch.—This genus is closely allied to *Gonia*, and the single species which it contains has generally been included in it; the chief points of difference between them are that in *Germaria* there is less tumidity of the cheeks, which are also less setose; there is greater obliquity of the facial angle; the facialia are ciliated along the lower part of their edges; and the fronto-orbital bristles are stronger, and extend lower down.

G. RUFICEPS, Fln.

This fly is black, covered with slate-grey tomentum; the palpi are yellow; the antennæ have the first two joints rufous, and the third black; the arista has the second and third joints of nearly equal lengths; the thorax has four black lines; the abdomen is oblong, with the second, third, and fourth segments encircled with a broad whitish band, and has no discal setæ; the wings are armed with a number of small spines at the bases of the first and third veins, and there is a short cubital appendix. Rare; it is figured in Curtis's British Entomology.

7.—SIPHONA, Mgn.

Gen. ch.—The little grey flies contained in this genus are characterized by having a long, filiform, horny proboscis, which is twice bent or elbowed; and also by the arista being bent towards the middle, at the junction of the second and third joints, the former of which is a good deal elongated, being more than half as long as the latter; the eyes are bare; the orbito-frontal bristles are in a double row (on each side) in both sexes; the antennæ are rather long, the third joint being two or three times the length of the second; the abdomen has all the rings of nearly equal width, and without setæ on the disc; the wings have the apical cross veins rounded at the base, and the first posterior cell terminating near the apex of the wing.

The frontalia are nearly of equal width in both sexes, and the orbito-frontal bristles being always in a double row, it is difficult at first sight to distinguish the males from the females, owing to which causes they have been separated, and described as distinct species; they may, however, be known from each other by the following characters: the third joint of the antennæ is about three times the length of the second in the males, and only about twice as long in the females; the abdomen is rather narrow and subcylindrical in the males, and thickened at the apex, in the females it is rather wider and flatter, and pointed at the end; the colour of the two sexes is also different, of the males being more or less testaceous, and that of the females cinereous.

1. First abdominal segment armed with setæ on the margin... 1. *geniculata*, De Geer.
2. First abdominal segment without setæ .... 2. *cristata*, F.

S. GENICULATA, De Geer.

flavifrons, Stæg., Schn., ♂.

Antennæ with the first two joints rufous, and the third black or grey; palpi yellow; thorax grey, unstriped, clothed with rows of black bristles and numerous short black hairs; scutellum grey, with apex often yellow; abdomen in the male yellowish-grey, often testaceous at the base and sides, with the apex and a longitudinal dorsal stripe grey; in the female it is entirely grey upon the dorsum, but sometimes a little yellow underneath at the base; the anterior edges of each segment are encircled with a narrow pale ring in both sexes; and there are two setæ in the middle of each segment near the edge, besides others on the sides; the legs are yellow, with the exception of the tarsi. Very common.

S. CRISTATA, F.

tachinaria, Mgn., ♂.
cinerea, Mgn., Rond., ♀.

This species, which may be at once known from the former by the absence of setæ on the middle of the edge of the first abdominal segment, has the male very similar to that of *S. geniculata*; the two basal joints of the antennæ are, however, sometimes partly nigrescent; the thorax is of rather a lighter grey, with pale shoulders, and the abdomen is more flavescent and translucent. The female, which seems to be less common than the male, is entirely of a pale bluish-grey colour, the under-surface of the abdomen only being a little lutescent; the femora are also partly grey. Mr. Bignell sent me three examples of the latter sex (the only ones that I have seen) in 1883, which were bred from *Leucania littoralis*.

8.—THRIPTOCERA, Mcq.

Gen. ch.—The little black and grey flies in this genus have the eyes bare, and widely separated in both sexes; the orbito-frontal bristles in a double row in both males and females; facialia unarmed; cheeks bare; antennæ with both basal joints short, and the third from three to four times longer than the second; arista mostly bent or elbowed, with the second joint elongated, but shorter than the third; abdomen oval, with the segments nearly equal in width, and only armed with setæ on the posterior margins; wings with some of the veins mostly setigerous, apical cross vein usually curved at the base, outer cross vein seated midway between the inner one and the curve of the fourth longitudinal vein; and first posterior cell terminating near the apex of the wing.

The males and females closely resemble each other.

1 (4) Wings with the alternate veins setigerous.
2 (3) Antennæ nigrescent .... 1. *crassicornis*, Mgn.
3 (2) Antennæ rufous .... 2. *pilipennis*, Fln.
4 (1) Wings with the third long vein only setigerous.
5 (6) Legs testaceous .... 3. *bicolor*, Mgn.
6 (5) Legs nigrescent.
7 (8) Second joint of arista short .... 4. *cognata*, Schn.
8 (7) Second joint of arista long .... 5. *minutissima*, Zett.

T. CRASSICORNIS, Mgn.

Antennæ black, with third joint long and thick, the basal joints are sometimes subrufous; palpi yellow; thorax grey and unstriped; scutellum grey; abdomen black, segments encircled on the front edges with a white ring or band, which is wider in the males than the females; legs nigrescent; wings with the first, third, and fifth veins setigerous. Not rare.

T. PILIPENNIS, Fln.

This species is very similar to the last, but has the antennæ smaller and rufous, the scutellum is also red at the apex, and the legs piceous; the wings have the bases yellow, and have the veins ciliated, as in *T. crassicornis*. Rare; Mr. Bignell sent me a specimen in 1882, which he had bred from a *Tortrix*.

T. BICOLOR, Mgn.

Antennæ rufous, third joint sometimes partly grey or black; palpi yellow; thorax grey and unstriped, with the shoulder points luteous; scutellum yellow; abdomen rufous, with a narrow pale band round the base of the segments; legs testaceous; wings with the third longitudinal vein only setigerous, the spines extending from the root of the vein to a little beyond the inner cross vein. Not rare; Mr. Bignell sent me several in 1882, bred from *Bombyx quercûs*.

T. COGNATA, Schn.

This is rather an aberrant species, for the second joint of the arista is short and indistinct, like the first; the wings also have only three or four setæ at the base of the third long vein. In other points, however, it resembles the foregoing species; the antennæ have the third joint large, thick, and black, with the basal joints rufous; palpi yellow; thorax grey, with four narrow black stripes on the front; abdomen black, with the second and third rings encircled with a white band, legs black. Rare.

T. MINUTISSIMA, Ztt.

This little species, only two or three mm. in length, has the second joint of the arista much elongated, it being about two-thirds of the length of the third joint, with which it is geniculated; the antennæ have the third joint thickened; the palpi are rufous or piceous; the thorax is cinereous, with the shoulders pale, and the dorsum marked in front with two narrow stripes; the abdomen is black, with a narrow white band round the front margins of the segments; the legs are black; the wings have the apical cross veins pale and rather indistinct, bluntly angular at the base, and joining the costa exactly at the apex of the wing; the veins are unarmed, except with one or two bristles at the base of the third vein. Rare; I have only seen two examples, which were found by the Rev. Mr. Bloomfield, at Guestling, near Hastings.

9.—BIGONICHETA, Rnd.

Gen. ch.—This genus is closely allied to *Thriptocera*, but differs by having the eyes slightly pubescent; the arista twice elbowed, all three joints being of nearly equal length; the cheeks setigerous; the abdomen with setæ on the disc, as well as on the margin of the segments; the wings with the fourth longitudinal vein bent at an angle (not curved), and the outer cross vein placed nearer to the inner one than to the angle of the fourth longitudinal vein. Other characters as in *Thriptocera.*

B. SPINIPENNIS, Mgn.

Palpi red; antennæ black, with the third joint a little rufous at the base; cheeks ciliated with bristles, which extend quite to the bottom, but are not seated on the edges of the facialia; thorax cinereous, marked with four longitudinal black lines, the inner pair being narrow and rather close together; abdomen grey, with a rather sinuous black band on the hinder part of each segment; legs black, with the coxæ tinged with red; wings with the first, third, and fifth longitudinal veins setigerous. Not common; Mr. Fletcher, of Worcester, sent me a specimen some years ago, which was bred from *Coccyx strobilella*; I captured one near Ulverstone, Lancashire, in 1886, and Mr. Billups sent me one for examination, which he had taken in his garden at Peckham. I believe that this species is only a variety of *B. setipennis*, Fln., as Meigen makes the chief difference to consist in the colour of the palpi, and many years ago I obtained two continental specimens from Herr Kowarz, captured at Asch, in Bohemia, which were named *B. setipennis*, and which had the ends of the palpi red.

10.—ACTIA, Dsv.

This genus, like the last, is so closely allied to *Thriptocera*, that I think they should both be considered only as subgenera. As in the parent genus, the arista is bent and has the second joint a good deal elongated; the veins of the wings are also setigerous, and the form, size, and colour of the body are very similar to those of the *Thriptoceræ.* The characteristic feature in *Actia* is the want of the apical cross vein in the wings, in which respect it resembles the genus *Rœselia*, Dsv., with which it was confused by Meigen, the *Thriptocera frontalis*, Mcq., being the same as *Rœselia Lamia*, Mgn.

A. FRONTALIS, Mcq. = pilipennis Fll. = lamia M.

Palpi piceous; antennæ black; thorax grey, and indistinctly striped; scutellum grey; abdomen shining black, with the front margins of the second, third, and fourth segments surrounded by a narrow white band, interrupted in the centre, so as to leave a longitudinal black stripe; legs nigrescent; wings with the first (auxillary branch), third, and fifth veins armed with bristles. I am not aware that this species has yet been found in Britain, but I have described it from continental specimens, so as to render the group of *Thriptoceratæ*, Desv., more complete.

(*To be continued.*) 153

NOTE ON THE GENUS *HYPSOIDES*, BUTLER.

BY W. F. KIRBY, F.L.S.

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The genus *Hypsoides* was founded by Mr. Butler in the "Cistula Entomologica," vol. iii, p. 1 (1882), for a new moth from Madagascar, which he called *H. bipars*, and which still remains the sole representative of the genus in the British Museum.

Some time afterwards, on examining the figure and description of *Bombyx Radama*, (*sic*) Coquerel [Ann. Soc. Ent. France (3), iii, p. 530 (1855) ; (4), vi, p. 342, pl. v, figs. 1, 1 (1866)], we came to the conclusion that the two species were closely allied, although specifically distinct. This is confirmed by a short paper just published by M. Mabille in the "Bulletin de la Soc. Ent. de France" (6), x, pp. cxlvi—cxlviii, in which he establishes a new genus, *Cœnostegia*, for *Bombyx Rhadama*, Coq., and places in it *Bombyx Rhadama* and *B. Diego*, Coq., and two new species, *Cœn. Barrei* and *C. flavens*, the last of which is closely allied to, if not actually identical with, *Hypsoides bipars*, Butl. *C. flavens* appears, however, to be a yellower insect.

Mabille regards *Cœnostegia* as allied to *Cnethocampa*, and proposes to establish a new family, *Cnethocampides*, for the two genera. It is, however, much more closely related to the African genus *Anaphe*, Walker, which was discussed by Lord Walsingham in the "Transactions of the Linnean Society of London," ser. 2, Zoology, vol. ii, pp. 421—426.

The majority of authors agree in referring the two anomalous genera, *Anaphe* from Africa, and *Hypsoides* (= *Cœnostegia*) from Madagascar, to the *Liparidæ*. Both genera agree in constructing a large silken pouch, which forms an outer covering for the gregarious pupæ.

Zool. Dept., Brit. Mus. (N. H.) :
April, 1891.

A LIST OF *HEMIPTERA-HETEROPTERA* COLLECTED IN THE ISLAND OF GUERNSEY.

BY W. A. LUFF.

During the last few years I have collected the *Hemiptera-Heteroptera* in this island, and, through the kindness of Mr. Edward Saunders, who has examined and named most of them, I am enabled to present a list of the species captured. No previous list, to my knowledge, has been published for Guernsey, and as many are rare in England, whilst others are not to be found there, I think it will prove of interest to collectors.

The species not found in England are indicated by *.

Eurygaster maura, Lin.—One specimen taken.

Geotomus punctulatus, Cost.—Not uncommon under stones, &c., on the cliffs.

Sciocoris cursitans, Fab.—Common in sandy places on the coast.

Aëlia acuminata, Lin.—Four specimens.

Peribalus vernalis, Wolff.—One.

Carpocoris fuscipina, Boh.—Very common on the cliffs. *C. baccarum*, Lin.—Common.

Piezodorus incarnatus, Germ.—Common.

Strachia oleracea, Linn.—Both the red and white spotted forms are common on the cliffs.

**Strachia ornata*, Lin.—One specimen taken of this beautiful species.

**Brachypelta aterrima*, Foerst.—Not uncommon on furze bushes on the cliffs in autumn.

Jalla dumosa, Lin.—Two.

Acanthosoma hæmorrhoidale, Lin.—Not uncommon.

Syromastes marginatus, Lin.—Very common.

Verlusia rhombea, Lin.—Four.

Coreus denticulatus, Scop.—One only.

Alydus calcaratus, Lin.—One.

Stenocephalus agilis, Scop.—Common.

Therapha hyoscyami, Lin.—Not common.

**Lygæus punctato-guttatus*, Fab.—This pretty little red and black species is very abundant at the roots of foxglove on the cliffs in the spring, summer, and autumn; they are gregarious, and follow each other along a track like ants. They were observed on sunshiny days in January and February of this year.

**Lygæosoma reticulatum*, H.-S.—Common on the cliffs.

Ischnorhynchus geminatus, Fieb.—Taken commonly by sweeping amongst heather on the cliffs.

Henestaris laticeps, Curt.—Common in sandy places on the coast.

Heterogaster urticæ, Fab.—One specimen.

Rhyparochromus dilatatus, H.-S.—Two. *R. chiragra*, Fab.—Two specimens. *R. chiragra*, var. *sabulicola*.—One.

Ischnocoris angustulus, Boh.

Macrodema micropterum.—One specimen taken, with wings developed.

Plinthisus brevipennis, Latr.

Stygnus arenarius.—Common.

Aphanus Rolandri, Lin.—Two specimens, taken many years ago. *A. lynceus*, Fab.—One. *A. quadratus*, Fab.—One of our commonest species.

Dieuches luscus, Fab.—Not uncommon.

Emblethis verbasci, Fab.

Drymus sylvaticus, Fab.—One.

Scolopostethus decoratus, Hahn.

Pyrrhocoris apterus, Lin.—Two specimens.

Monanthia cardui, Lin.—Common.

Hydrometra stagnorum, Lin.—Occasionally abundant.

Velia currens, Fab.—Common.

Aëpophilus Bonnairei, Sign.—Several specimens of this curious species were taken by Mr. Marquand at low water mark on our south coast, and I captured a single specimen in the same locality on September 28th, 1890.

Gerris thoracica, Schum.—Common.

Nabis lativentris, Boh.—Not rare. *N. rugosus*, Linn.—One.

Cimex lectularius, Lin.—Common in some houses in town, scarcely to be found in the country parishes.

Lyctocoris campestris, Fall.—One.

Temnostethus pusillus, H.-S.—One.

Anthocoris nemorum, Lin.

Miris lævigatus, Lin.—Very abundant.

Megalocerœa ruficornis, Fourc.—One.

Phytocoris tiliæ, Fab.—Several specimens. *P. varipes*, Boh.—Not common.

Calocoris bipunctatus, Fab.

Oncognathus binotatus, Fab.—Very common.

Lygus pratensis, Fab.—Extremely abundant. *L. pabulinus*, Lin.—Several.

Heteroptera merioptera, Scop.—Several specimens.

Nepa cinerea, Lin.—Not common.

Ranatra linearis, Lin.—Rare.

Notonecta glauca, Lin.—Very abundant in most ponds. *N. glauca*, var. *maculata*.—Not so common as the type.

Corixa Geoffroyi, Leach.—Very abundant. *C. atomaria*.—Very common. *C. mœsta*.—I have taken one specimen.

Guernsey: *April 6th*, 1891.

Pimpla graminellæ.—I have again been favoured with cocoons of *Pimpla graminellæ* from Mr. Gardner, Hartlepool, who found them spun up in the webs of *Orgyia antiqua*; from one of these batches I bred one male and four females. The principal reason of this record is that the species of the genus *Pimpla* have been looked upon as solitary parasites; these cocoons are very similar to those from which I bred *Pimpla rufipleura*, and which I compared when describing them to a cluster of *Macrocentus* cocoons.—G. C. Bignell, Stonehouse, Plymouth: *April 8th*, 1891.

The habits of Humble Bees in New Zealand.—In No. 1 of the resuscitated "New Zealand Journal of Science" (January, 1891)—which we wish all success—is a long and interesting article on the introduced *Bombi* in New Zealand, by Mr. Geo. M. Thomson, F.L.S., full of information, and ending with a list of plants of which the flowers are visited by the bees. Our readers will remember that the primary object in introducing the bees into the Colony was the fertilization of the red clover. We take the following extract as showing how modification of surroundings influences habit:—

" A remarkable point in connection with the life of the humble bee is, that in many parts of the Colony they do not appear to hibernate at all. In England those insects which survive the winter appear about April, and immediately proceed to seek out suitable quarters for the establishment of their homes. In this part (Dunedin) of the Colony the past winter was extremely mild, and the hibernation of the bees was very short. I saw them nearly daily on various flowers right through the summer and autumn up till June 5th. On the following day the weather became suddenly cold, and the bees disappeared until August 13th. For nearly a month afterwards the weather remained fine, and night frosts were frequent, yet for a few hours in the middle of the day the bees were seen regularly. Mr. James Gilmore, of Goodwood, about 30 miles north of Dunedin, states that he saw them right through the winter, except in rainy weather. In the middle of July, when the nights and mornings were very frosty, the bees came out in the middle of the day if the sun was shining. If this is so in this comparatively cold part of the Colony, we may expect that in those parts where frost is unknown no hibernation will take place at all. It is worthy of note, however, that only large females survive the winter. This season the first small bees of the new brood were seen by me on November 22nd. The rate of increase of the humble bee has been so great in this Colony, that the question has arisen in my mind as to whether they would not become as serious a nuisance, so far as honey is concerned, as the rabbit has proved to the farmer and squatter. With two exceptions I have never heard of them visiting the flowers of indigenous plants."

And yet it is only a very few years ago that the first humble bees were introduced into New Zealand !—Eds.

Lytta vesicatoria, L., and other Coleoptera from Hants and Dorset.—Among some beetles lately sent to me by my cousin, Mr. J. H. Fowler, of Ringwood, Hants, I found the following :—from Ringwood, Hants, a small but very good specimen of *Lytta vesicatoria*, L. (this species has also been recorded from Hants by Mr. Moncreaff), also specimens of *Carabus nitens*, *Calosoma inquisitor*, *Mordella fasciata*, *Limonius minutus*, *Clythra quadripunctata*, &c. ; from Sturminster Newton, North Dorsetshire, *Eryx ater*, *Cryptocephalus sericeus*, *nitidulus*, and *lineola*, *Phytœcia cylindrica*, *Oodes helopioides*, *Haplocnemus impressus*, *Hoplia philanthus*, and *Homaloplia ruricola* ; and from Wimborne, Dorset, *Carabus nitens*, *Elater sanguinolentus*, *Rhynchites pubescens*, *Pogonochœrus bidentatus*, and *Trox sabulosus.*—W. W. Fowler, Lincoln : *April* 11*th*, 1891.

Heterocerus britannicus, Kuwert : a new species described from Britain.—In the " Verhandlungen der kaiserlich-königlichen zoologisch-botanischen Gesellschaft in Wien," December, 1890, p. 535, Herr Kuwert describes a new species of *Heterocerus* (*H. britannicus*) as from " England." Mr. Champion having called my attention to the paper, I wrote to Herr Kuwert, who kindly told me that the single male on which he described the species came to him through M. Bellier de la Chavignérie, labelled " Anglia, Reiche." I then sent him three or four species from my collection, and among them a small species which I received some years ago as *sericans* from Mr. Lennon, of Dumfries : this proved to be Herr Kuwert's *britannicus.* My specimens are very small reddish insects, with obsolete darker spots, but the specimen on which it has been described appears to be darker. The following is Herr Kuwert's description (*l. c.*, p. 535) :—"Thorax plainly broader than the elytra, the latter with obscure red spots with thick yellowish pubescence; thorax black, with short and less thick pubescence, with a distinct red central line and badly defined reddish sides, very strongly widened in the middle and a little narrowed in front. Male with the clypeus raised into a prominence on its anterior margin, and with the intermediate tibiæ strongly widened beneath. Legs and apex of abdomen reddish. L., 2 mm."

The species which we know as *H. fusculus*, Kiesenwetter, appears to be really *H. pulchellus*, Kies., and it is doubtful whether we possess the former species at all; in fact, the whole genus, as arranged in our British collections, appears to be in utter confusion. I am preparing a paper on the genus, and hope to be able to clear up one or two more points; it appears, however, to be difficult to know whether the sexes are not sometimes confused as separate species, and I should be very much obliged if any collector would forward me undoubted pairs of any species, common or uncommon. The male and female are usually found together in one mud burrow, which is not occupied by more than one pair. I have found *H. pulchellus* in numbers in April at Luccombe Chine, Isle of Wight, but it appears to be an entirely local species.—ID.: *April* 10*th*, 1891.

Since writing the above, Mr. McLachlan has kindly called my attention to a description of a new species of *Heterocerus*, from Scandinavia, by B. Varenius, in the "Entomologisk Tidskrift" (Stockholm), 1891, Haft 1, p. 22, named *H. Mölleri*; it is apparently closely allied to *H. fusculus*, from which it appears to differ a little in size, and in having the front tibiæ furnished externally with seven spines. It seems very doubtful at first sight whether it will prove a distinct species; it is described in company with a new *Megarthrus*.—W. W. F.

Homalota princeps, &c., at Ventnor.—During ten days spent at Ventnor, from the 3rd to the 13th of this month, I captured a few insects of interest, although the weather was not altogether favourable for entomological work. I never remember such a scarcity of *Hymenoptera* at this time of the year. Even on two really bright sunshiny mornings, I only saw the following species :—*Halictus longulus*, 1 (this is a rare species, and one I was glad to meet with); *Andrena fulvicrus*, 4 or 5 ♂ and ♀; *Anthophora pilipes*, several ♂ and ♀; *Bombus terrestris* and *Derhamellus* and *Apis mellifica.* I was collecting on the sheltered side of the hills just above the sea, facing S. and S.W. The gorse was out in fair blossom, and also a few sallows here and there, so that one might have expected to have met with spring *Andrenæ*, &c., in abundance, which made the above result very disappointing.

Coleoptera, however, were more encouraging. By shaking seaweed above high water mark I secured three *Lymnæum nigropiceum*, six *Homalota princeps*, surrounded by plenty of its allies, *puncticeps*, *halobrectha* and *vestita*, two of *plumbea*, *Aleochara algarum* and *grisea*, *Phytosus spinifer* and *balticus* (the former fairly common, the latter very rare, only four specimens occurring), two *Medon pocofer*, and others. I suppose I spent about five hours altogether searching the seaweed, which was in the little bay just opposite Steep Hill Castle.

In *Hemiptera* I found a single *Zicrona cœrulea* crawling up a grass stem, a really beautiful creature in the sunshine.—EDWARD SAUNDERS, St. Ann's, Woking: *April* 15*th*, 1891.

Capture of Hister marginatus near King's Lynn.—The dearth of *Lepidoptera* last season may be assigned as the principal reason of my giving attention for the first time to *Coleoptera*, and it is not improbable that I shall devote more or less attention annually to this fascinating group; a group which, to say the least of it, gave me plenty of employment in an otherwise rather discouraging season, so far as *Lepidoptera* were concerned. Amongst my captures in beetles sent to Mr. E. A. Newbery, who kindly identified them for me, is a specimen of *Hister marginatus*. This insect was picked up one afternoon in June on a road-side near this town. As Mr. Newbery informs me it is a rare insect, I thought it worth recording.—E. A. ATMORE, King's Lynn, Norfolk: *March 20th*, 1891.

Abundance of Retinia turionana near King's Lynn.—For several years past I have been in the habit of searching for pupæ of this species, but never until this year have I met with them commonly. As a result of twice searching for them recently, I have taken in all thirty-eight healthy pupæ. I need scarcely add that many ichneumon parasites were found, for I must have destroyed at least 150.—ID.

Habits of Cymatophora flavicornis.—It struck me as being worth recording that on the sunny afternoon of March 28th last, while netting some specimens of *Brephos Parthenias* in some woods near here, I noticed a greyish insect fluttering round the birch trunks, which on capture proved to be a male specimen of *C. flavicornis*. Is it generally known that this species ever flies by day? From the business-like search among the trees which this insect was making (and which it resumed on release), it appeared to me to be in search of a female. I may add that I have taken this species subsequently, feeding on sap from a punctured birch trunk, at night.—R. M. PRIDEAUX, 28, Berkeley Square, Bristol: *April 3rd*, 1891.

Obituary.

Prof. Felipe Poey, C.M.Z.S., died on January 28th in the ninety-second year of his age, at Havana (Cuba), where he was born in 1799, and where he passed all his life, save a few years spent as a student at Paris. He was one of the founders of the French Entomological Society, and was elected a Corresponding Member of the Zoological Society of London in 1836. Poey was a profound naturalist, best known as an ichthyologist, but he published several papers on the *Lepidoptera* of Cuba, and also a bulky volume on the general Natural History of the Island. Moreover, he largely assisted others, and in Hagen's Synopsis of North American *Neuroptera*, his name is very frequently quoted in connection with Cuban species. He retained his love of Nature to the last, notwithstanding his patriarchal age. We conclude this short notice by quoting the words of a well-known entomologist who met him at Havana in 1857—58:—"Already at that time he looked old; his sallow complexion gave him the appearance of a man worn out by the climate. He was a remarkable instance of the macrobiotic quality of the study of Nature. He was a *savant* in the full sense of the word; at the same time charming and entirely unpretending in his manner." There remain few naturalists who have reached so great an age, even in climates far less trying.

Societies.

BIRMINGHAM ENTOMOLOGICAL SOCIETY: *March 16th*, 1891.—Mr. W. G. BLATCH, President, in the Chair.

Messrs. P. T. Pope and H. Pope were elected Members of the Society.

Mr. Blatch said he had noticed a large number of spring *Lepidoptera* at Hopwas Wood a few days previously, and had noticed that among the *Hibernia leucophœaria* light specimens seemed to prefer birch trees, and dark specimens oak and other trees with darker barks, their colours thus being assimilated to their surroundings. Mr. Thornewell said that round Burton-on-Trent he noticed what appeared to be two forms of *Phigalia pedaria*; one large and light found early in the open country, and one smaller, darker, and found later in the Woods. Mr. Thornewell exhibited a number of *Xanthiæ*, and read notes on them, making several suggestions which provoked considerable discussion, in which Messrs. Blatch, Bradley and Wainwright joined.

April 6th, 1891.—Mr. R. C. BRADLEY in the Chair.

Mr. C. J. Wainwright showed long series of *Cheilosia œstracea* and *Volucella pellucens*; the former from Somersetshire, the latter from Wyre Forest and other localities. Mr. R. C. Bradley showed *Echinomyia grossa* and *fera*. Mr. H. J. Sands showed a piece of ebony completely destroyed by some large larvæ.—COLBRAN J. WAINWRIGHT, *Hon. Sec.*

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY: *April 13th*, 1891.—The President, Mr. S. J. CAPPER, F.L.S., F.E.S., in the Chair.

Messrs. J. Collins, of Warrington, and W. R. Scowcroft, of Prestwich, were elected Members.

Mr. J. E. Robson, F.E.S., of Hartlepool, read a paper, entitled, "Are *Abraxas pantaria* and *A. ulmata* one species or two?" After remarking on the difficulty of obtaining exotic specimens of the genus, the author said that *pantaria* had been admitted into the British list on the authority of one specimen, taken at Oakhampton Park, Somerset, he referred to their geographical distribution, stating that *pantaria* only occurred in places where *ulmata* was absent, he then minutely described the two forms, comparing the markings of each, and pointed out the difference in the genital armature, which he considered was due to local and climatic causes, altering the form of the genitalia. The paper, which was fully illustrated by many cases containing examples of the genus, led to considerable discussion, as to what constituted a species. Mr. Tutt sent for exhibition the series of *Miana*, from Armagh, that recently caused so much controversy among London entomologists; but so palpably distinct were the specimens of *fasciuncula* and *strigilis*, and so obvious the ease with which the examples could be separated, that no discussion arose. Mr. Robson exhibited some fine varieties of butterflies, and Mr. Collins a wonderful variety of *Leucania lithargyria*, which had the hind-wings deeply fimbriated with dark scales, the central portion of the wing being light.—F. N. PIERCE, *Hon. Sec.*, 143, Smithdown Lane, Liverpool.

ENTOMOLOGICAL SOCIETY OF LONDON: *April 1st*, 1891. — Professor R. MELDOLA, F.R.S., Vice-President, in the Chair.

Mr. G. A. Booth, of Grange-over-Sands, North Lancashire, and Mr. W. Manger, of New Cross, S.E., were elected Fellows of the Society.

Mr. H. J. Elwes showed a small but very interesting collection of butterflies from Laggan Alberta, N.W. Territory of Canada, taken by Mr. Bean at high elevations in the Rocky Mountains. Amongst them were *Colias Elis*, Streck., which seemed to be very close to, if not identical with *C. Hecla*, of Europe, *Argynnis Alberta*, W. H. Edw., and *Chionobas subhyalina*, W. H. Edw. The resemblance between the butterflies of this locality and those found on the Fells of Lapland was very striking, some of the species being identical, and others very closely allied. Mr. Elwes said that it was another proof if one were wanted, of the uniformity of the butterflies found throughout the boreal region in the Old and New Worlds.

Mr. G. C. Champion exhibited several insects recently received from Mr. J. J. Walker, from Hobart, Tasmania. The collection included a curious species of *Forficulidæ*, with asymmetrical forceps, from the summit of Mount Wellington; two mimetic species of *Œdemeridæ* belonging to the genus *Pseudolycus*, Guér., and the corresponding *Lycidæ*, which were found with them; also specimens of both sexes of *Lamprima rutilans*, Er.

Mr. N. M. Richardson exhibited a specimen of *Zygæna filipendulæ* with five wings; a second specimen of the same species with the middle legs on the right side much dwarfed; four specimens of *Gelechia ocellatella*, including a pink variety, bred from *Beta maritima*; four specimens of *Tinea subtilella*, a species new to Britain, taken last August in the Isle of Portland; also specimens of *Nepticula auromarginella*, a species new to Britain, bred from larvæ taken near Weymouth, on bramble. Dr. Sharp and Mr. McLachlan commented on the structural peculiarities of the two specimens of *Zygæna*.

Mr. C. Fenn exhibited a series of *Tæniocampa instabilis*, which had been bred out of doors during the recent severe weather. They were all bred from ova laid by the same female, and many of them were of an abnormally pale colour. Mr. Fenn said that, according to Mr. Merrifield's theory, these pale specimens, in consequence of the temperature to which they had been subjected in the pupal state, ought to have been very dark. Mr. Jenner Weir, referring to the pale specimens, said he had never before seen any of so light a colour.

Mr. W. Dannatt exhibited a butterfly belonging to the genus *Crenis*, recently received from the Lower Congo. He said he believed the species was undescribed.

Mr. G. A. J. Rothney sent for exhibition several specimens of an ant (*Sima rufo-nigra*), from Bengal, together with specimens of a small sand wasp (*Rhinopsis ruficornis*) and a spider (*Salticus*), both of which closely mimicked the ant. It was stated that all the specimens exhibited had lately been received from Mr. R. C. Wroughton, Conservator of Forests, Poona. Mr. Rothney also communicated a short paper on the subject of these ants and the mimicking sand wasps and spiders, entitled, "Further notes on Indian Ants."

Mr. G. C. Champion read a paper, entitled, "A list of the Heteromerous *Coleoptera* collected by Mr. J. J. Walker, R.N., in the neighbourhood of Gibraltar, with descriptions of four new species." At the conclusion of the meeting a discussion ensued, in which Mr. Kirby, Mr. Elwes, Mr. McLachlan, Mr. Jenner Weir, Dr. Sharp, and Mr. Crowley took part.—H. Goss, *Hon. Sec.*

MICRO-LEPIDOPTERA COLLECTED NEAR CANNES, 1890.

BY THE RIGHT HON. LORD WALSINGHAM, M.A., F.R.S., &c.

The following somewhat rich list of captures in the time devoted to collecting during three months spent on the south coast of France in the spring of 1890 may be of interest to others who visit the locality. I have to acknowledge the valuable and willing assistance received at all times from my esteemed colleague, Mons. A. Constant, to whose long acquaintance with the *Lepidoptera* of France, accompanied by a thorough knowledge of the botany of the district, I am indebted for many of the more interesting species here mentioned. I had the pleasure and advantage of his companionship on several occasions in the Estérel hills and elsewhere, with free access to his well-arranged collection. Having been in the neighbourhood of Cannes during the spring months of several years, with only occasional intervals, I am convinced that, notwithstanding the diligent and careful study so long devoted to the subject by Mons. Constant, and by the late Mons. P. Millière, many unobserved species of *Micro-Lepidoptera* still remain to be discovered, and I look forward hopefully to a winter campaign next year. The genera *Gelechia* (in its widest sense), *Coleophora*, *Bucculatrix*, and *Nepticula* are those which appear to be most richly represented in the coast district. I have not remained sufficiently late in the summer to penetrate to the adjacent mountain-range of the Alpes-Maritimes, undoubtedly rich in species.

By referring to my notes of previous years, a far more extensive list could be made, but one of the objects in view is to show what may be done in a limited space of time, and I am not aware that more than two or three of the species taken before 1890 would be additions to those already recorded by other authors.

The following descriptions refer to two new species of *Coleophora*, and a new *Stagmatophora* mentioned below. I leave the new *Lita* to be dealt with at some future time, in the hope that Mons. Constant may add it to the already numerous discoveries he has made known to his fellow-workers. He informs me that he is about to publish further descriptions of several new species, some of which he has kindly permitted me to mention by his MS. names, in anticipation of his next paper.

COLEOPHORA BIFRONDELLA, *sp. n.*

Antennæ, white, annulated with greyish-brown.

Palpi, white.

Head, white; face slightly tinged with greyish-brown.

Thorax, white.

Fore-wings, greyish-brown, the costal margin throughout distinctly white, dorsal margin narrowly white; a white streak along the lower edge of the fold, and a second streak above the fold, commencing near its base and ending in the dorsal margin beyond its outer extremity; cilia of the costal and apical margins whitish, those of the dorsal margin pale greyish-brown.

Hind-wings, pale greyish-brown, with slightly paler cilia.

Abdomen, pale greyish-brown.

Legs, whitish, faintly touched with greyish-brown on the hind tarsal joints.

Exp. al., 10 mm.

Hab.: Cannes. Type, ♂ ♀, Mus., Wlsm.

The larva feeds on *Satureia montana* on the slopes of the hills above the water canal to the east of Cannes. It forms its case by mining and cutting off one of the minute leaflets, the shape of which is well preserved, to this it usually attaches a second mined leaflet as its growth proceeds, and this second leaflet is sometimes fixed obliquely at the apex of the first, giving the case a somewhat angulated appearance.

The species appears to be allied to *C. sarothamni* (the *calycotomella* of Millière), but it is much smaller; the white streaks are more distinct and uniform, with an almost total absence of the intermediate slender branches, or streaklets, observable in the larger insect. The case is also widely different. Mons. Ragonot considers it close to *gypsophilella*, but decidedly distinct.

COLEOPHORA STÆHELINELLA, *sp. n.*

Antennæ, white, the basal joint thickened with scales beneath, but not tufted.

Palpi, white.

Head, white.

Thorax, hoary-white, with a greyish-brown, longitudinal, median line.

Fore-wings, hoary-white, with slender cinereous lines somewhat clearly defined; of these the most important starts from the base above the middle, and is continued somewhat widely to nearly the middle of the wing-length, whence it is depressed towards the dorsal margin before the apex, and emits from its upper edge four slender parallel streaks, which extend outwards to the costal margin, the outer one nearly reaching the apex; above its basal half is a slender detached sub-costal streak, and a few cinereous scales about the base of the costa; from below the base of this central streak is emitted another slender streak, running above and parallel to the fold, reaching the dorsal margin at one-third from the apex, and continued around the dorsal margin and apex to the costal margin, where it ceases, nearly opposite to the point at which it struck the dorsal margin after receiving at least the outer three of the costal branches of the central streak; another cinereous streak lies below the fold, and the dorsal margin itself is narrowly cinereous as far as the end of this streak, or for rather more than half of the wing-length; costal and apical cilia white, but a strong brownish-grey shade runs along their middle, being diffused beneath the apex, and overspreading nearly the whole width of the dorsal cilia.

Hind-wings, brownish-grey, with shining pale brownish-grey cilia.

Abdomen, pale brownish-grey.

Legs, posterior pair clothed above with long hairs of the same colour as the cilia of the hind-wings; tarsal joints whitish, unspotted. Exp. al., 11—12 mm.

Hab.: Cannes, Agay, l'Estérel, Beaulieu.

Type, ♂ ♀. Mus., Wlsm.

The larva feeds upon *Stæhelinus dubius.* It hollows out the whole width of one of the narrow leaves, and forms its case by cutting off a sufficient length of the hollow leaf to contain it. The upper-side of the leaf being much darker than the under-side, which is whitish, the case has a rather peculiar bicoloured appearance. The mouth is slightly oblique; the whole case is somewhat flattened, elongate, narrowly ovate, and the posterior end rounded. The larva frequently leaves its case in feeding, and is found mining to the end of the long narrow leaf, so that in beating the plant it is not unusual to find several empty cases in the beating net. The young larva makes a smaller case, which it exchanges for one of larger capacity as its growth advances. Length of the case, usually about 6—8 mm.

This species appears to be nearly allied to *Coleophora obtectella*, Z., from Syracuse, but the cilia of the hind-wings are darker, the wings are less narrowly pointed, and the markings are more closely defined than in that species; moreover, the antennæ are white, not annulated. *C. obtectella*, described in the Lin. Ent., vol. ix, p. 333 (1849), appears to have been accidentally omitted from the latest Sicilian lists. Mons. Ragonot advises me that it is near to *chamædryella* and to *santolinella*, Cst., but differs from the latter in its plain (not annulated) antennæ.

STAGMATOPHORA, H.-S.

STAGMATOPHORA ROSMARINELLA, *sp. n.*

= larva mining leaves of *Rosmarinus officinalis*, Stn. Tin. S. Eur., 215, 365 (1869).

Antennæ, alternately annulated with fuscous and white, towards the apex the last four white spots are evenly, but more widely, separated than on the basal two-thirds; a white spot on the upper-side of the basal joint.

Palpi, white; with a black spot on the outside at the base, and another before the apex of the second joint; apical joint with two slender black streaks, running throughout its length on each side.

Head, smooth; shining steel-grey.

Thorax, deep brown.

Fore-wings, brown, with three white costal streaks; two before and one beyond the middle, the former pointing obliquely outwards, the latter obliquely inwards, each tipped with golden metallic scales; on the dorsal margin are four golden metallic spots: the first two more or less in conjunction with the golden ends of the streaks above them, the outer two being right and left of the apex of the third costal streak; at the extreme apex is a bright golden metallic spot; these golden markings are all distinctly and brilliantly iridescent, and the white streaks on the costa are very pure, and with a silvery lustre; cilia greyish-fuscous.

Hind-wings, grey, with greyish-fuscous cilia.

Abdomen, grey.

Legs, brown, tarsal joints spotted with white. Exp. al., 6—7 mm.

Larva, mining leaves of *Rosmarinus officinalis*, March and April.

Imago, June 21st—July 7th.

Hab.: Pont St. Louis (Stn.); Monaco and Beaulieu (Wlsm).

Type, ♂ ♀, Mus., Wlsm.

The only differences I can detect between this species and *Grabowiella*, Stgr., are as follows: the white on the costal margin is more purely white and silvery, the golden scaling is more distinctly iridescent, having lilac- and rosy-purple reflections, which do not exist to the same extent in *Grabowiella*, the hind-wings are decidedly grey, not brown, the antennæ having a different pattern, the four spots nearest the apex being evenly divided, and not separated from the more thickly spotted part of the stem by any broad brown band, whereas in *Grabowiella* the basal half is thickly spotted with white, this is followed by a broad brown band, and beyond it are five evenly divided white spots; the spotting of the hind tarsal joints is also somewhat different, in this species there are four distinct white spots, in *Grabowiella* only three, the fourth being the foot itself.

The larva of this insect was discovered by Mr. Stainton in 1866, but he did not succeed in rearing the imago. Its life-history, which is recorded in "The Tineina of Southern Europe," p. 215, is as follows:—

> "A yellowish larva, mining the leaves of rosemary (*Rosmarinus officinalis*); the mined leaves become yellowish-brown, and rather inflated; some excrement is protruded through a hole on the under-side of the leaf, generally at the end of the mine nearest the foot-stalk.
>
> The larva I have thus described:—
>
> Length, 2 lines; yellowish, the incisions between the segments rather paler; the head dark brown; the second segment with a brown plate above; the anal segment with a small grey plate; all the legs (16) pale yellowish. The larva is rather active.
>
> I met with these on the 27th March, the day before I left Mentone, on the rocks above Pont St. Louis, on the Italian side.
>
> I did not succeed in rearing anything from them."

The larva, with which I have been well acquainted for several years, differs from that of the closely allied *Grabowiella* in its habit of pupating within the mined leaf, never forming a case of excrement, but it moves from one leaf to another when feeding.

SPECIES.	LARVA.	ON	BRED.	CAPTURED.	LOCALITY.	REMARKS.
PTEROPHORIDÆ.						
Agdistis, Hb.						
Heydenii, Z.	March 4	*Atriplex halymus*	June 8		Cannes.	
staticis, Mill.	March	*Statice cordata*	May 15		Beaulieu.	
tamaricis, Z.	May 6	*Tamarix africana*	June		La Bocca (Cannes).	
Pterophorus, L.						
punctinervis, Cst.	April 29	*Carlina corymbosa*			Cannes	I have not yet succeeded in breeding this species.
tetradactylus, L.	May 6	*Lavandula spica*	May 10	May 18	Cannes.	
baptodactylus, Z.	April 6	*Helichrysum angustifolium*	June 3		near Eze	Green, with long hairs as long as body, white spiracular line.
TORTRICIDÆ.						
TORTRICINÆ.						
Teras, Tr.						
Schalleriana, L.	May 7	*Alnus*, sp.	May 20		Var.	
Pandemis, Hb.						
heparana, Schiff.	May 7	*Alnus*, sp.	June 11		Var.	
Tortrix, L.						
pronubana, Hb.	March	polyphagous	May		Cannes, &c.	
croceana, Hb.	May 7	*Daphne gnidium*	May 16		Var.	A pupa found in united shoots.
Amphisa, Crt.						
joannisiana, Rag.	May 10	*Lavandula stæchas*	September 29		Agay	Larva remained unchanged till 10th Sept. (Milliére's figure, Icon., pl. cliii, fig. 13, closely resembles this). *Tortrix steineriana*, var. *stelviana.*
Sciaphila, Tr.						
Wahlbomiana, L.				May 7	Var.	
——— var.?	April	*Poterium sanguisorba*	May		Cannes.	
CONCHYLINÆ.						
Conchylis, Tr.						
maculosana, Hw.				May 5	l'Estérel.	

SPECIES.	LARVA.	ON	BRED.	CAPTURED.	LOCALITY.	REMARKS.
affinitana, Dgl.	March 4	*Aster tripolium*	June and July	Apr. 25, &c.	Golf Juan (Cannes)	= *cancellana*, Z.—Larva hibernating in the stems.
zephyrana + margarotana, Dp.				April 20	Cannes.	
implicitana, Wk.				April 20	Cannes	probably = H.-S., fig. 369 (*heydeniana*).
contractana, Z.				April 20	Cannes.	
rubricana, Pey.				May 6—18	Cannes	Not uncommon near the canal above Cannes.
atricapitana, Stph.				April 22	Cannes.	
flavillana, Stgr.	April	*Helichrysum angustifolium*	May 4	May 4	La Bocca (Cannes).	
GRAPHOLITHINÆ.						
RETINIA, Gn.						
tessulatana, Stgr.	February 15, &c	*Cupressus*	May 6, &c.		Cannes	I have also bred this from berries of *Juniperus oxycedrus*; these specimens are brighter in colour than those from Cypress.
EUDEMIS, Hb.						
botrana, Schiff.				May 10	Cannes.	
helichrysana, Rag.	Mar. 6—Apr. 25	*Helichrysum angustifolium*	May 20—June 3		Cannes, Valescure	Not uncommon at La Bocca (Cannes)
cinerariana, Rag.	March	*Cineraria maritima*	April		Beaulieu and Cannes.	
PENTHINA, Tr.						
sellana	March	*Dipsacus sylvestris*	April 20		Cannes.	
Doubledayana, Brt.	May 7				Var.	I failed to rear these, being too late for a supply of healthy larvæ.
SERICORIS, Tr.						
lacunana, Schiff.				April	Cannes.	
PÆDISCA, Tr.						
fusculana, Z.				April 20	Cannes.	
immundana, F. R.				May 7	Var.	
cynosbana, F.	April, end	Roses in gardens	May 20		Cannes.	

SPECIES.	LARVA.	ON	BRED.	CAPTURED.	LOCALITY.	REMARKS.
Semasia, Stph.						
aspidiscana, Hb. (var.)	March 4 (pupa)		April 25	April 28	Golf Juan (Cannes)	Pupa spun up among dry leaves of *Artemisia gallica*, probably fed upon *Aster tripolium*.
Tmetocera, Ld.						
ocellana, F.	May 7	*Salix* or *Alnus*	June 3—25		Var.	
Grapholitha, Tr.						
succedana, Fröl.				May 12	Hyères.	
oxycedrana, Mill.	April	*Juniperus oxycedrus*	June—July, Oct.		Cannes	One specimen emerged very late, October 16th.
compositella, F.				May 7	Var.	
orobana, Tr.					Cannes.	
opulentana, Mill.	April	Fungus on galls in stems of *Juniperus oxycedrus*	May 5	May 5	Cannes.	
Carpocapsa, Tr.						
Reaumurana, Hein.	Nov. (1889)	Acorns of *Quercus coccifera*	Oct. 10		Costebelle (Hyères).	
amplana, Hb.	Nov. (1889)	Acorns of *Quercus coccifera*	Oct. 10		Costebelle (Hyères).	
molybdana, Cst.	Nov. (1889)	Acorns of *Quercus coccifera*	Oct. 12—19		Costebelle (Hyères).	
Coptoloma, Ld.						
janthinana, Dp.	March 6	*Cratægus oxyacantha*	May 20—June 15		La Bocca (Cannes).	
Phthoroblastis, Ld.						
cytisana, Z.				May 11	Cannes	One specimen above the canal.
CHOREUTIDÆ.						
Millieria, Rag.						
dolosana, H.-S.				May 5	l'Estérel.	
Simæthis, Leach.						
nemorana, Hb.				Feb. 27	Valescure.	
TINEIDÆ.						
EUPLOCAMINÆ.						
Melasina, Bdv.						
lugubris, Hb.					Cannes	Empty case found adhering to a wall.

SPECIES.	LARVA.	ON	BRED.	CAPTURED.	LOCALITY.	REMARKS.
CRINOPTERYX, Pey.						
familiella, Pey.	March, April	*Cistus salviæfolius*	September		l'Estérel and La Bocca (Cannes).	
TINEINÆ.						
BLABOPHANES, Z.						
imella, Hb.				April	Cannes.	
nigricantella, Mill.				April 18	Cannes.	
ADELINÆ.						
ADELA, Latr.						
australis, Z.				April 29	Common everywhere.	
ACROLEPIANÆ.						
ACROLEPIA, Crt.						
vesperella, Z.	April 6	*Smilax aspera*		April 20	Beaulieu.	
granitella, Tr.				April 20	Cannes.	
eglanteriella, Mn.	May 10	*Helichrysum angustifolium*			Agay.	Bred and captured in former years.
HYPONOMEUTINÆ.						
HYPONOMEUTA, Z.						
egregiellus, Dp.	April	*Erica arborea*	June		Cannes.	
PRAYS, Hb.						
oleellus, F.	April	*Olea europæa*	June—July		Cannes	Larvæ brought to England were successfully reared on *Ligustrum*.
PARADOXUS, Stn.						
osyridellus, Stn.	May 10	*Osyris alba*	May 31		Agay	A good series bred. The larvæ are affected by a species of *Mermis*.
PLUTELLINÆ.						
THERISTIS, Hb.						
mucronella, Sc.				Feb. 27	Valescure	Two specimens.
GELECHIANÆ.						
BRYOTROPHA, Hein.						
figulella, Stgr.				May 14	La Bocca (Cannes).	

SPECIES.	LARVA.	ON	BRED.	CAPTURED.	LOCALITY.	REMARKS.
Lita, Tr.						
gallicella, Cst.	March 4	*Artemisia gallica*	April 12—28		Golf Juan (Cannes)	Abundant.
halymella, Mill.	March 4	*Atriplex halymus*	April 20		Golf Juan (Cannes).	
submissella, Stn.	March 12	*Camphorosma monspeliaca*	April		Beaulieu	[Ann. and Mag. Nat. Hist. (3 s.), iii, 212—3 (1859).] This species was not uncommon in 1889; it was not hitherto known beyond Madeira.
artemisiella, Tr.	May 10	*Satureia montana*	June 19—27		Agay	Larger than British specimens.
sp. nov.	May 10	*Stæhelina dubia*	July 14—Aug. 27		Agay	Mining out the whole interior of the leaves. Abundant.
provinciella, Stn.				April 28	La Bocca (Cannes).	
gypsophilæ, Stn.	May 4—6	*Gypsophila saxifraga*	June 24—30		La Bocca (Cannes)	The galls are usually on the surface of the ground, or scarcely above it. This species does not appear to have been observed since Mr. Stainton described it in 1869.
Teleia, Hein.						
cisti, Stn.	March 4	*Cistus salviæfolius*			Golf Juan (Cannes)	Very young larvæ; these go on feeding until June at least.
triparella, Z.				May 12	Hyères.	
Ptocheuusa, Hein.						
subocellea, Stn.				May 4	La Bocca (Cannes).	
littorella, Dgl.				May 5	La Bocca (Cannes).	
inopella, Z.				May 4	La Bocca (Cannes).	
Parasia, Dp.						
paucipunctella, Z.	May 6 (pupa)	*Stæhelina dubia*		May 7	Cannes and Var.	
Ergatis, Hein.						
subdecurtella, Stn.	May 7	*Lythrum salicaria*	May 15		Var.	
oxycedrella, Mill.	March	*Juniperus oxycedrus*	August		Cannes.	
Xystophora, Hein. (= Doryphora, Hein.).						
servella, Z.				May 4	La Bocca (Cannes).	
gypsella, Cst., MS.	March—April	*Aster acris*	May		l'Estérel and Cannes	Galls on stems.

SPECIES.	LARVA.	ON	BRED.	CAPTURED.	LOCALITY.	REMARKS.
ANACAMPSIS, Crt.						
biguttella, H.-S.	March	*Dorycnium hirsutum*	April		Cannes.	
ligulella, Z.				May 7	Var.	
MESOPHLEPS, H.-S.						
silacellus, Hb.	March	*Helianthemum tuberarium*	May		l'Estérel	In the seeds.
corsicellus, H.-S.	March	*Helianthemum tuberarium*	May—July		l'Estérel	In the seeds.
YPSOLOPHUS, F.						
fasciellus, Hb.				May 6	La Bocca (Cannes).	
lotellus, Cst.	May 7	*Lotus rectus*	May 20		Var.	
NOTHRIS, Hb.						
declaratella, Stgr.	April 21	*Scrophularia lucida*	May 30—June 24		La Trayas and Monte Carlo.	
SYMMOCA, Hb.						
signella, Hb.	April 30	*Rosmarinus officinalis*	September 17		Beaulieu	Among *débris*, attached by web to stems or shoots of rosemary.
DEPRESSARIANÆ.						
DEPRESSARIA, Hw.						
putridella, Schiff.	May 11	*Peucedanum officinale*	June 18		l'Estérel	(= *peucedanella*, Mill.).
rutana, F.	May 15	*Ruta angustifolia*	June 4		Thèoule and Beaulieu.	
subpropinquella, Stn.	March 4	*Centaurea aspera*		Feb. 27	Golf Juan (Cannes) and Valescure.	
feruliphila, Mill.	May 12	*Ferula nodiflora*			Hyères.	
cnicella, Tr.	May 15	*Eryngium campestre*	June 7—18		Cannes.	
nanatella, Stn.	May 18	*Carlina corymbosa, vulgaris*, &c.	June 8		Cannes.	
chironiella, Cst., MS.	May 10	*Opoponax chironium*	June 13		Agay	Pointed out to me by Mons. Constant, who is about to describe this species; larvæ much affected by a *Mermis*.
CARCINA, Hb.						
quercana, F.	March 4	*Quercus pubescens*			Golf Juan (Cannes)	This larva is very abundant on *Arbutus*, in the Estérel, as well as on various species of oak; it frequently produces the var. *purpurana*, Mill.

SPECIES.	LARVA.	ON	BRED.	CAPTURED.	LOCALITY.	REMARKS.
ŒCOPHORINÆ.						
Pleurota, Hb.						
ericella, Dp.				May 12	Hyères.	
Cacochroa, Hein.						
permixtella, H.-S.	May 6	*Phillyrea angustifolia, latifolia, &c.*	June 25		Cannes	Common at Cap d'Antibes, &c., bred from larvæ sent by Mons. Constant in June.
Anchinia, Hb.						
laureolella, H.-S.	May	*Daphne gnidium*	May 30—June 7		Cannes.	
Œcophora, Z.						
Jourdheuillella, Rag.	March—April	*Pinus maritima*	May 25—June 15		l'Estérel	Several specimens bred in 1888, 1889, 1890.
DASYCERINÆ.						
Dasycera, Hw.						
sulphurella, F.				April 20	Cannes.	
CHAULIODINÆ.						
Chauliodus, Tr.						
pontificellus, Hb.				May 5	Cannes.	
daucellus, Pey.	April	*Thapsia villosa* and another umbellifera	May		Monte Carlo and Cannes.	
Ochromolopis, Hb.						
ictella, H.-S.	May 8	*Thesium divaricatum*	May 26—June 11		Cannes	A long series bred.
LAVERNINÆ.						
Limnœcia, Stn.						
phragmitella, Stn.	April	*Typha latifolia*			La Bocca (Cannes)	Larvæ observed feeding in the heads of the *Typha*.
Stagmatophora, H.-S.						
Nickerlii, Nick.				May 3	La Bocca (Cannes).	
Grabowiella, Stgr.	May 10	*Lavandula stœchas*	August 8		Agay.	

SPECIES.	LARVA.	ON	BRED.	CAPTURED.	LOCALITY.	REMARKS.
rosmarinella, Wlsm.	April 6	*Rosmarinus officinalis*	June 21—July 7		Beaulieu & Monte Carlo	sp. nov., described above, a long series bred.
serratella, Tr.				May 3	Cannes.	
albiapicella, H.-S.				May 4—18	Cannes.	
PYRODERCES, Z.						
argyrogrammos, Z.				April	Cannes.	
STATHMOPODA, Stn.						
Guerini, Stn.				March 9	Beaulieu	Two hibernated specimens.
BUTALINÆ.						
BLASTOBASIS, Z.						
anthophaga, Stgr.	May 10	*Lavandula stœchas*	July 2—13		Agay.	
? sp. nov. vel præc var.	April 30	*Rosmarinus officinalis*	August 1—17		Beaulieu	Very similar to *anthophaga*, but the only two specimens bred are decidedly smaller.
PANCALIA, Crt.						
Leuwenhoekella, L.				April	l'Estérel.	
ELACHISTINÆ.						
ELACHISTA, Stn.						
nigrella, Haw.				Feb. 27	Valescure.	
fadella, Mill. ?	April 25 (pupa)	*Poa* sp.	May 8		Golf Juan (Cannes)	Two specimens bred are distinct from any species with which I am acquainted. I have had no opportunity of comparing them with *Elachista fadella*, Millière.
collitella, Dp.				May 5	l'Estérel.	
dispunctella, Dp.				May 11	Cannes.	
argentella, Cl.				April	Cannes.	
rufocinerea, Haw.				May 5	l'Estérel.	
chrysodesmella, Z.				April	Monte Carlo.	

SPECIES.	LARVA.	ON	BRED.	CAPTURED.	LOCALITY.	REMARKS.
Urodeta, Stn.						
cisticolella, Stn.				April	Cannes	I did not meet with larvæ this year, but have bred it freely in former years from *Cistus monspeliensis.*
BATRACHEDRINÆ.						
Batrachedra, Stn.						
Ledereriella, Z.	March—April 6	*Salix pendula* and *Rosmarinus officinalis*	May8–Aug.15-17	May 5	Cannes and Beaulieu	From dry rubbish on old leafy galls hanging on a weeping willow in middle of town.
COLEOPHORINÆ.						
Coleophora, Z.						
albitarsella, Z.	May 18	*Parietaria* ?	July 8		Cannes	Plant not identified at time.
amethystinella, Rag.				April 20—29	Cannes	Open ground among olive trees.
auricella, F.	April 20	*Betonica officinalis*	June 7		l'Estérel.	
ditella, Z.	March 7	*Artemisia campestris*			St. Raphael.	
congeriella, Stgr.				May 11—18	Cannes	Among *Dorycnium suffruticosum.*
conspicuella, Z.	May 6	*Aster acris*	September 9th		Cannes	A single larva among cases of *Rœssleri.*
cælebipennella, Z. ?	April 6	*Helichrysum angustifolium*			Eze	I failed to rear the larvæ, although they lived to May 15th.
Wockella, Z.	April 20	*Betonica officinalis*	July 2—13		l'Estérel and Agay.	
leucapennella, Hb.				May 13	Hyères.	
saponariella, Heeger				May 10	Agay.	
asteroidella, Mill.	May	*Dorycnium hirsutum* and *suffruticosum*			Cannes	= *acrisella*, Mill.
troglodytella, Dp.	May 6	*Aster acris*	September 15, &c.		Cannes	Over 25 cases collected up to May 8th; a few after.
albicella, Cst.	Mar. 4—Apr. 25	*Artemisia gallica*			Golf Juan (Cannes)	Very abundant, but too young to rear.
acmella, Cst., MS.	Mar. 4 (hibernated)		not bred		Golf Juan (Cannes)	Cases found under bark of old willow stump, where *Lotus rectus* grows.
ocymoidella, Rnd.	Mar. 30—Apr. 6	*Saponaria ocymoides*	July 27—Sept. 6		Beaulieu.	

SPECIES.	LARVA.	ON	BRED.	CAPTURED.	LOCALITY.	REMARKS.
Roessleri	Apr. 29—May 6	*Aster acris*	June 16—Aug. 6		Cannes	Over 50 cases collected up to May 8th; a few after.
stæhelinella, Wlsm.	Mar. 12—Apr. 6	*Stæhelina dubia*	Aug. 7—Sept. 17		Beaulieu	sp. nov., described above; 7 specimens bred.
bifrondella, Wlsm.	May 6	*Satureia montana*	September 6—17		Cannes	sp. nov., described above; a good series bred.
sp. ?	April 21	*Inula conyza*			La Trayas.	
GRACILARIANÆ.						
GRACILARIA, Z.						
tringipennella, Z.	March 7	*Plantago lanceolata*			Valescure.	
ononidis, Z.				May 5	Cannes.	
latifoliella, Mill. & Rag.	April 19	*Phillyrea latifolia* and *angustifolia*	May 12		Isle St. Marguérite (Cannes).	
ARGYRESTHIANÆ.						
ZELLERIA, Stn.						
phillyrella, Mill.	April 19	*Phillyrea media* and *latifolia*	May		Isle St. Marguérite (Cannes).	
LITHOCOLLETINÆ.						
BEDELLIA, Stn.						
somnulentella, Z.	Mar. 12—Apr. 6	*Convolvulus cantabrica* and *althæoides*	March 30		Beaulieu	Abundant.
LITHOCOLLETIS, Z.						
roboris, Z.	Feb. 19	*Quercus*	April 29—May 8		Cannes	Under-side mine.
hortella, F.	Feb. 19	*Quercus*	April 27		Cannes	Under-side mine.
alniella, Z., var ?	May 7	*Alnus*	May 20		Var.	Under-side mine. Differs from typical *alniella* in paler ground colour, more distinctly dark margined streaks, and square, less oblique, first dorsal streak.
sublautella, Stn.	Feb.—March	*Quercus pubescens* and *robur*	March 26, &c.		Cannes	Under-side mine, not easily distinguished from that of *scitulella*.
pomifoliella, Z.				April 12	Cannes.	
distentella, Z.	March	*Quercus pubescens*	April 8		Cannes	Under-side mine.

SPECIES.	LARVA.	ON	BRED.	CAPTURED.	LOCALITY.	REMARKS.
endryella, Mn.	Feb. —March	*Quercus suber*			Valescure and Cannes	= *caudiferella*, Rag. Under-side mine. Abundant.
lantanella, Schrk.	April 23	*Viburnum tinus*		May 2	Cannes	Under-side mine.
joviella, Cst.	March 12	*Quercus ilex*	April 12		Beaulieu	Upper-side mine.
scitulella, Z.	February	*Quercus pubescens*	April 28, &c.		Valescure and Cannes	Under-side mine.
quercifoliella, Z.	March	*Quercus pubescens*	April		Valescure and Cannes	Under-side mine.
messaniella, Z	February, &c.	*Quercus ilex*, &c.			Cannes, &c.	Under-side mine. Abundant.
platani, Stgr.	March 9 (pupæ)	*Platanus*		March 30	La Bocca (Cannes)	Under-side mine; in old dry leaves of plane trees.
delitella, Z.	February	*Quercus pubescens*	April 26		Valescure and Cannes	Under-side mine. Scarce.
quinquenotella, Frey	March	*Genista pilosa*	May 10		Cannes	Upper-side mine. Only one specimen.
triflorella, Pey.	March	*Cytisus triflorus*	April 10		Cannes	Upper-side mine.
sp. ?				April	Cannes	A minute species, apparently undescribed, among *Artemisia campestris.*
Kleemannella, F.				April 24	Napoul.	
trifasciella, Hw.	February	*Lonicera implexa*			Valescure	Under-side mine. Scarce.
TISCHERIA, Z.						
marginea, Hw.	Mar. 29—Apr. 3	*Rubus fruticosus*	May 2—30	May 12	Cannes.	
angusticollella, Z.	Feb. 27	*Rosa sempervirens*	April		Valescure and Cannes.	
LYONETIANÆ.						
PHYLLOBROSTIS, Stgr.						
daphneella, Stgr.	May 10	*Daphne gnidium*	May 26—June 19		Agay, Cannes, &c.	
PHYLLOCNISTINÆ.						
BUCCULATRIX, Z.						
cratægi, Z.				May 18	Cannes.	
maritima, Stn.	Mar. 4—Apr. 25	*Aster tripolium*	April 20, &c.	May	Golf Juan (Cannes)	Abundant.
albiguttella, Mill.				April 24	Napoule	Previously unique; compared with the type in Mus. Ragonot.

SPECIES.	LARVA.	ON	BRED.	CAPTURED.	LOCALITY.	REMARKS.
alaternella, Cst.	May 6	*Rhamnus alaternus*	May 28—June 13		Cannes and La Trayas.	
artemisiæ, H.-S.	March 4	*Artemisia gallica*	April 13	April 28	Golf Juan (Cannes)	Larva not observed, but bred from cocoon in bottle.
gnaphaliella, Tr. ?				March 9	La Bocca (Cannes)	A single specimen, possibly distinct from *gnaphaliella*, or a variety.
helichrysella, Cst.	Mar. 6—Apr. 12	*Helichrysum angustifolium*	April 28–May 18	Apr. 6–May 4	Valescure, La Bocca (Cannes), and Eze	Larvæ easily shaken into a net or umbrella from the heads of the plant.
NEPTICULINÆ.						
Opostega, Z.						
menthinella, Mn.				May 11	Cannes.	
Nepticula, Z.						
anomalella, Goeze				April 20	Cannes.	
splendidissimella, H.-S.	March	*Rubus fruticosus*	April		Beaulieu.	
angulifasciella, Stn.	Feb. 27—Mar. 7	*Rosa sempervirens*	June 13		Valescure and Cannes	Larva whitish, with dark green dorsal vessel. Abundant.
rubivora, Wk.	Mar. 29—Apr. 3	*Rubus fruticosus*	May 1—17		Cannes.	
suberis, Stn.	Feb. 20—Mar. 7	*Quercus suber*	April 20		Valescure, Cannes, &c.	Green larva.
cistivora, Pey.	March	*Cistus salviæfolius* and *monspeliensis*	Sept. 29—Oct. 10		Cannes	Almost every leaf of every plant in certain localities contains one or more larvæ; cocoons formed of grains of sand.
euphorbiella, Stn.	April 6	*Euphorbia dendroides*	June 27		Beaulieu	Abundant.
cryptella, Stn.	October, 1890	*Dorycnium hirsutum*	August 10—21		Hyères.	
ilicella, Cst., MS.	March 7	*Quercus ilex*	May—June		Valescure	Red larva; small, inconspicuous mine at edge of leaf.
suberoidella, Cst., MS.	March	*Quercus ilex*	April 15		Cannes	A larger mine; larva yellowish. These two species will be described by Mons. Constant, who showed me the larvæ.

London: 1891.

ANNOTATED LIST OF BRITISH *TACHINIIDÆ.*

BY R. H. MEADE.

(*continued from page* 129.)

11.—PLAGIA, Mgn.

Gen. ch.—Middle-sized nigrescent species, with the outer cross veins of the wings extremely oblique. Eyes in some species hairy, in others bare; widely separated, and with a double row of *orbito-frontal* bristles on the frontalia in both sexes; antennæ with the second joint elongated, it being from one-half to two-thirds of the length of the third joint; arista with the second joint slightly prolonged; facialia unarmed; cheeks more or less deeply ciliated by a continuation of the orbito-frontal bristles, which in some species is prolonged quite to the epistome; wings with one or more of the veins setigerous, and with a cubital appendix; fore tarsi of the males with the last joint provided with long claws and bristles.

Rondani divides this genus or group (*Plagidæ*, Dsv.) into three subgenera, viz., *Cyrtophlæba*, *Blepharigena*, and *Plagia*, the first, which has the eyes hairy, and the cheeks ciliated quite to the epistome, may be looked upon as a well marked genus, but the distinctions between the other two are so slight as not to be worth notice; *Blepharigena* only differing from *Plagia* by having the cheeks rather more deeply ciliated, and the middle abdominal segments with discoidal setæ, which characters I find to be very variable.

1 (2) Eyes hairy (*Cyrtophlæba*, Rnd.) ....1. *ruricola*, Mgn.
2 (1) Eyes bare.
3 (4) First and third veins setigerous.. 2. *ruralis*, Fln.
4 (3) Third vein only setigerous.
5 (6) Antennæ wholly black .... 3. *trepida*, Mgn.
6 (5) Antennæ with first two joints testaceous .... 4. *curvinervis*, Ztt.

P. RURICOLA, Mgn.

Eyes hairy; palpi yellow; antennæ with the first two joints testaceous, and the third black, the second joint nearly as long as the third; cheeks ciliated quite to the epistome; thorax black, covered with light grey tomentum, and having four longitudinal stripes; abdomen black, with wide, irregular, grey, transverse fascia, expanded on the sides of the segments, no setæ on the middle of the second and third rings, but having the median marginal spines placed at some distance from the edge; legs black; wings with the third longitudinal vein ciliated from the base to the little cross vein; cubital appendix short. I have not seen a British specimen of this species, but Walker has included it among his *Tachinæ*, the description being, however, very vague.

P. RURALIS, Fln.

Eyes bare, palpi black with yellow ends; antennæ black, with the third joint about one-third longer than the second; orbito-frontal bristles scarcely extending half way down the cheeks; thorax and abdomen similar to those in *P. ruricola*; legs black; wings with the outer cross veins sinuous, and less oblique than those in the other species, the first (auxillary branch) and third veins both spinigerous; cubital appendix short. Not uncommon.

P. TREPIDA, Mgn.

Eyes bare; palpi and antennæ black, the latter with the third joint about one and half times as long as the second; cheeks ciliated nearly to the bottom; thorax grey, with four black stripes, the central pair being narrow; abdomen black, with grey reflections, and armed on the central segments with both marginal and discal setæ; legs black; wings with the outer cross vein straight and very oblique, and with the third longitudinal ciliated from the base to a short distance beyond the little cross vein; cubital appendix rather long. Rare; I captured one specimen in 1876 near Bicester, Oxon.

P. CURVINERVIS, Ztt.

Eyes bare; palpi yellow; antennæ with the two basal joints testaceous, the third black, and fully twice as long as the second; cheeks ciliated about half way down; thorax grey, with four rather indistinct stripes; abdomen as in *P. trepida*, with white reflections, and spines both on the disc and edges of the segments; legs black; wings with the outer cross veins very oblique, and with the third vein ciliated along almost its whole length; cubital appendix short. Generally distributed, but not common; Mr. Billups sent me one, bred from *Pœdisca sordidana*.

12.—GYMNOCHÆTA, Dsv.

Gen. ch.—The species in this genus are of a bright golden-green colour; the forehead and face are prominent; the eyes hairy and much nearer together in the males than in the females; the antennæ are drooping, with the second joint elongated and about two-thirds of the length of the third joint; the cheeks are bare, but the chin hairy; the abdomen is subglobose, and has both discal and marginal setæ; the wings have the fourth longitudinal vein bent at an acute angle, and the outer cross vein placed near to the angle.

G. VIRIDIS, Fln.

This, the only recorded British species, has the sides of the frontalia glossy green, the central stripe being rufous; the palpi and antennæ are black; the thorax and abdomen are of a brilliant green colour, with sometimes a coppery tinge; the legs are black, with the bases of the femora green; the wings have a yellowish-brown tinge, and the fourth longitudinal vein has a short cubital appendix. Not uncommon.

13.—MACQUARTIA, Dsv.

Gen. ch.—This genus contains a number of moderate or small sized species, with ovoid or oblong bodies, often of a bright metallic blue-black or bronze colour; the males have the eyes approximate or contiguous, and hairy; in the females they are moderately separated, and often only pubescent; the antennæ are short, with a tomentose arista; the facialia are unarmed; the cheeks are bare, but the mentum or chin is hairy or bristly; the abdomen has both discal and apical setæ; the wings have the fourth longitudinal vein bent in a curve or blunt angle, and the first posterior cell opens near the apex of the wing. These flies are not common, and several species are difficult to determine, being very much alike.

1 (8) Colour bright metallic or blue-black.
2 (3) Palpi yellow.................. .... 1. *tenebricosa*, Mgn.
3 (3) Palpi piceous or black.
4 (7) Abdomen with white reflections.
5 (6) Colour blue-black ... ... 2. *spinicincta*, *sp. n.*
6 (5) Colour bronze .... 3. *nitida*, Ztt.
7 (4) Abdomen without white reflections ... .4. *chalybeata*, Mgn.
8 (1) Colour dull black or grey.
9 (12) Legs black.
10 (11) Palpi yellow......... . ...5. *ciliaris*, Ztt.
11 (10) Palpi black ... ...6. *grisea*, Fln.
12 (9) Legs partly or wholly yellow ....7. *dispar*, Fln.

M. TENEBRICOSA, Mgn.

Shining metallic-blue or bronze-black; eyes contiguous in the male, and separated by about a fourth of the width of the head in the female; frontal stripe rufous or piceous in the latter sex; fronto-orbital bristles only extending slightly below the base of the antennæ, which are black, and have the third joint about one and a half times the length of the second; arista thickly pubescent; palpi yellow; thorax grey upon the front and sides, and marked with four black stripes, the central pair being rather wide apart and narrow; there are four external dorso-central bristles behind the transverse groove; abdomen with very slight grey reflections; dorsal setæ weak, and seated upon both the disc and edges of segments; legs black; calyptra brown in the male, and nearly white in the female; halteres yellow; wings brown in the male, and nearly clear in the female; apical cross vein slightly curved inwards, outer cross vein sinuous. Not common; I have found both sexes near Lake Windermere.

M. SPINICINCTA, *sp. n.*

This, which is about the largest British species (length, 7—9 mm.), has the thorax wide and the abdomen oval; the colour is shiny blue-black, with white tomentum and reflections; the male has the forehead and face rather flat; the eyes approximate, the frontalia ciliated with very long, strong, and thickly set fronto-orbital bristles, which spread out upon the upper part of the cheeks and terminate in a large group or patch opposite the base of the third joint of the antennæ; margins of frontalia black, central stripe rufous or piceous; cheeks white, with black reflections; antennæ short, basal joints piceous, third joint about equal in length to the other two, and black; arista long and tapering, somewhat thickened at the base, and very shortly pubescent; epistome very slightly prominent, with long fibrissæ, and having a row of bristles extending backwards along the margins of the mouth (peristome); chin rufous, clothed with soft hairs; palpi black or piceous; thorax marked upon the front margin with four widish black stripes, the central pair often divided by a narrow line; external dorso-central bristles, three behind the transverse groove; abdomen with white reflections on the sides, the first segment has two central marginal spines, the second segment has two central discal ones, and two marginal ones; the third is surrounded by two transverse rows of strong setæ, one running across the centre or disc, and the other on or near the edge; the fourth segment is armed with numerous spines; the legs are black; the wings have a brownish-yellow tinge, the apical cross vein is straight, with a blunt or rather rounded angle at the base; the outer cross vein is oblique and sinuous, the third longitudinal vein has several setæ at the base. This species, of which I do not know the female, is not uncommon; I formerly confounded it with the *M. cœlebs* of Rondani.

M. NITIDA, Ztt.

This species is very similar to *M. tenebricosa,* but differs by having the palpi black or piceous, instead of yellow; the arista less pubescent; the middle thoracic stripes wider; the external dorso-central bristles three instead of four in number behind the groove; the abdomen more oblong, and with more white reflections on the sides. Rare; in Mr. Dale's collection.

M. CHALYBEATA, Mgn.

Glossy black or blue-black, without any white tomentum or reflections, with the exception of a little on the shoulders in the female; the eyes in the male are somewhat separated (subcontiguous); the palpi black; the posterior external dorso-central bristles three in number; the calyptra yellow; the halteres piceous; the wings nearly clear, with the apical cross vein nearly straight and curved at the base, and the third longitudinal vein bristly from the base nearly to the little cross vein. Not common; I have captured it in Oxfordshire, also received it from Mr. Matthews in S. Devon, and it is in Mr. Dale's collection.

M. CILIARIS, Ztt.

Dull grey; eyes in the female moderately separated; forehead rather prominent; frontalia white, with a rather narrow black central stripe; palpi yellow; antennæ with the third joint nearly twice as long as the second; arista thickened at the base, long, and very slightly pubescent; eyes very shortly haired; thorax with four black stripes, and three external dorso-central bristles behind the groove; abdomen cylindrico-conical, grey, with an irregular wide black band on the hinder portions of each segment, and with two discal setæ in the centre of the second and third segments, as well as two median apical ones; legs black; calyptra white; halteres yellow; wings with a distinct costal spine, and with the apical, as well as the outer cross veins, straight. Very rare; the male is not known.

M. GRISEA, Fln.

Dark grey; male with the eyes subcontiguous; female with them moderately wide apart, and with a broad rufous central stripe down the frontalia; antennæ black, with the second joint rufous in the female; palpi black; thorax with the dorsum black in the male, and the front edge and shoulders pale grey, it has three external dorso-central bristles, and is marked by four longitudinal black lines, which are much more distinct in the female, in which the dorsum is grey; abdomen grey in both sexes, but darker in the male; it is without any definite markings, but very setose, and has the spines seated upon little black spots; the third segment is encircled by two transverse rows of bristles, as in *M. spini-cincta*; legs black; calyptra and halteres yellow; wings yellow at the base. Rare.

M. DISPAR, Fln.

rufipes, Mgn. and Macq.
flavipes, Mgn.?, ♀.

The male of this species is very much like that of the last (*grisea*), but differs in having yellow palpi, rufous or piceous basal joints to the antennæ, and reddish tibiæ, the abdomen also shows dark reflections; the female closely resembles the male, but has the abdomen lighter in colour, and the coxæ, femora, and tibiæ entirely yellow. Rare; in Mr. Dale's collection.

14.—POLIDEA, Mcq.

HARRISEA, Mgn., Rnd.

Gen. ch.—Eyes hairy, separated rather widely and equally in some species in both sexes, and also having the fronto-orbital bristles in a double row; in other species (according to Meigen) having the eyes of the males contiguous; antennæ with the third joint about twice the length of the second; arista bare; abdomen ovate, with or without discal setæ; wings with the first posterior cell nearly closed, and ending near the tip of the wing, apical cross veins mostly curved at the base, third longitudinal vein spinose.

P. CRASSITARSIS, Ztt.

simplicitarsis, Ztt.
ænea, Ztt., *non* Mgn.
rebaptizata, Rnd.

This little bronzed or bright black species (from 5 to 6 mm. in length), the only one recorded as British, closely resembles some of the *Macquartiæ*, it differs, however, by having the eyes widely separated, and the fronto-orbital bristles in a double row in both sexes; the sides of the frontalia are glazed and bronzed; the cheeks are white and bare; the chin is somewhat rufous and hairy; the arista is bare and thickened for two-thirds of its length; the thorax and abdomen are of a shining brassy or bluish-black colour, without any white tomentum or reflections; and the latter has setæ (rather small) both on the disc and edges of the segments; the legs are black, having the fore tarsi a little dilated in the female. The males have the fore tarsi simple, and may also be known by the shape of the abdomen, which is ovato-cylindrical with the apex thickened, while in the female is is ovate, rather flattened, and pointed. I have selected Zetterstedt's name of *crassitarsis* in preference to the others, because it is more characteristic than *simplicitarsis*, which no doubt belongs to the male of the same species. The name of *ænea* was applied by Meigen to some other species, which seems to be now unknown, described as having the eyes contiguous in the male, and the abdominal segments without discal setæ; this was probably a *Macquartia*. Rare; the female is more common than the male.

(*To be continued.*) 228

NEW LONGICORN *COLEOPTERA*, CHIEFLY FROM MEXICO.

BY H. W. BATES, F.R.S.

Two of the following species are additions of great interest to the Coleopterous Fauna of Mexico, for specimens of which I am indebted to the liberality of Mr. Julius Flohr. I have added descriptions of a few new species of *Deltaspis*, a New World genus, allied to our European *Purpuricenus*, which have also been recently received.

PYRODES MACULICOLLIS.

Oblongus, æneseenti-niger, thorace grosse intricato-rugoso, nitido, utrinque apud angulos anticos macula aurantiaco-flava; elytris vermiculato-rugulosis subopacis, ♂ æneo-fuscis anguste indistincte rufo-marginatis, ♀ fulvo-rufis. Antennæ utroque sexu corpore breviores, purpureo-cupreæ vel cyaneæ, articulis 3—10 *♂ subcylindricis robustis, ♀ apicem versus gradatim dilatatis.*

Long., ♂, 30—33 *mm.*, ♀, 38—50 *mm.*

Canelos, State of Durango, Mexico.

This fine northern species of *Pyrodes* differs in no essential point of structure from the type of the genus, *P. speciosus*, of S. Brazil. The antennæ in the ♂ are of similar form to those of *P. speciosus*, ♀, being only a little longer, and the joints a little broader. In the ♀ the width of the joints is still greater, especially towards their apices. In the very small difference as to length and form the antennæ of the new species most resemble those of *Mallaspis xanthaspis* and *rhombodera*. The head is porrect, parallel-sided, coarsely rugose, and with the central furrow and the concavity of the forehead much deeper than in *P. speciosus*. The thorax is as broad as the elytra, dilated and rounded (with edge serrated) immediately from the anterior angles and to the very sharp lateral spine, after which it is abruptly narrowed. The scutellum is moderately large, acute-angular, coarsely rugose, and channelled down the middle. The elytra are broadly rounded at the apex, with a short sutural spine.

ESMERALDA COSTULATA.

E. columbinæ (*Guér.*) *affinis, paullo latior, aurato-viridis resplendens, elytris utrinque costulis lævibus quatuor nec basin nec apicem attingentibus; subtus viridi-cyanea polita.* *Long.*, 25 *mm.*, ♀.

River Madeira, Amazons (Coll., Bates).

Rather more broadly oblong than individuals of the same sex of *E. columbina* and *E. lætifica*. The central groove of the head is broad and deep; the antennæ reach to more than half the length of the elytra, joints 3—10 being compressed and triangular, with inner apices produced. The thorax is short and very broad, very uneven, the disc having a broad, transversely-placed, trilobed groove or pit, coarsely punctured like the sides, the elevated parts of the disc being smooth. The extremely large scutellum has a few punctures; the elytra are shagreened between the polished costæ and near the apex, where the costæ terminate in irregular ramifications. The base of the elytra is very sparingly and more coarsely punctured. The prosternum differs from that of the other two species in being conically and strongly elevated between the branches.

VESPEROCTENUS, *nov. gen.*

Gen. Vespero (*Latr.*) *affinis, a quo differt inter alia antennis,* ♂, *longe pectinatis elytrisque utroque sexu corporis apicem attingentibus.*

This anomalous form of Longicorn is, without doubt, closely allied to the European genus *Vesperus,* although beyond the pallid colour and the softness of the integuments there is little general resemblance. The head is transverse-quadrate behind the eyes, in both sexes, and the neck suddenly constricted. The eyes, as in *Vesperus*, are coarsely facetted, but they are more reniform, being sinuated on the upper inner edge. In the ♀, which can be most easily examined owing to its freedom from the dense pile of the ♂, the forehead below the antennæ emits a laminiform projecting ledge, deeply notched in front, below which is the subvertical epistome, followed by the articulated labrum, densely ciliated on its front edge. The mandibles are long, porrect, curved only near the apex, and irregularly dentated on their inner side, with an angle (indicating the commencement of a tooth) on the outer edge at the bend; in miniature they resemble the mandibles of *Macrodontia cervicornis.* The palpi are elongate, the terminal joint short, ovate. The thorax is similar in form to that of *V. Xatarti*, ♀, but a little more dilated behind; in the ♂ it is short and trapezoidal. The pronotum has no lateral margin. The elytra are elongate-cuneiform, nearly as in *Toxotus*. The anterior coxæ are strongly exserted and parallel. The elytra are entire in both sexes, and of thin, flexible texture. The legs are slender, the tarsi four-jointed: the first much the longest, and, like the second, with produced apical angles; in the third joint the angles are still more produced; the true fourth joint is visible as a small nodule at the base of the claw joint. The hindmost legs in the ♀ are widely separated at their base. In the ♂ the abdomen is short and conical. The antennæ in the ♀ are 12-jointed, filiform, simple, about half the length of the body; in the ♂ they are equally 12-jointed, three-fourths the length of the body, the joints third to the eleventh emitting at their apices a long, linear, and compressed branch quadruple the length of the stem of the joint, except the branch of the eleventh, which is equalled in length by the extremely long twelfth joint.

Mr. Flohr informs me that the specimens were taken by Mr. Becker at night, by spreading a white sheet on the ground and lighting a fire, which attracts them; they come out of the ground after the manner of the *Cebrios* and *Scaptoleni*. Their habits are, no doubt, similar to those of the *Vesperi*, which are subterranean in their early stages.

VESPEROCTENUS FLOHRI, *n. sp.*

Pallide fusco-testaceus, tenuiter pubescens elytris glabris; ♂, capite et thorace dense fulvo-sericeo-lanuginosis, hoc medio penicillis elongatis obscurioribus quatuor, elytris grosse coriaceis subcostulatis. *Long.*, 22 *mm.*

Durango, Mexico (*Becker*), communicated by Mr. Julius Flohr.

DELTASPIS DISPARILIS.

Subcylindrica, nigra; ♂ thorace (marginibus incrassatis anticis et postico nigris exceptis) elytris prosterno et abdomine rubris, ♀ abdomine solum rubro elytrorum epipleuris rufescentibus. *Long.*, 19—20 *mm.*

Canelas, in Durango (*Flohr*).

Of the numerous allied species this approaches nearest in mode of punctuation to *D. nigripennis.* The head is very coarsely and irregularly, the thorax strongly but separately, punctured, with smooth elevated spaces, and without trace of lateral tubercle. The elytra are a little more finely, and much more densely, punctured, and clothed with short tawny hairs, the apex of each bisinuate-truncated. The thorax is more elongate, ovate-quadrate, than in the allied species.

DELTASPIS MARGINELLA.

Minor, anguste cylindrica, opaca, thorace abdomine (interdum corpore subtus toto) vittaque epipleurali læte rufis; capite, elytris suprá, antennis et pedibus nigris; thorace subalveolato-punctato lateribus medio plus minusve angulatis. *Long.*, 11—12 *mm.*, ♂ ♀.

Canelas, in Durango (*Flohr*).

As in *D. alutacea*, the thorax, though glabrous, has a peculiar opaque surface, on which the punctuation is with some difficulty determinable. It is very close, even on the nodular elevations. The elytra are finely pubescent, and very densely but separately punctulated; the apex is obliquely and obtusely truncated; the red vitta on the epipleura is very broad at the shoulder, and gradually tapering to beyond the middle, where it ceases.

Deltaspis variabilis.

Closely allied to *D. marginella*, but readily distinguished by its more or less shining thorax, on which the similar subalveolate punctuation is readily detected: the lateral angle or tubercle is generally prominent, but is sometimes (as in other species of the genus) absent. The colour is variable, the thorax, generally bright red with blue-black anterior and posterior borders, is sometimes suffused with the dark colour. The elytra, finely and densely punctured, are red, sometimes with broad basal and sutural blue-black margins, or wholly blue-black, with the epipleuræ alone red. Long., 10—14 mm, ♂ ♀.

State of Guerrero, Mexico (*Baron*), communicated by Mr. Harford.

11, Carleton Road, Tufnell Park, N.W:
May, 1891.

ON THE STRUCTURE OF THE CLAWS IN *STERNOCŒLIS* AND *HETÆRIUS*, AND NOTES ON THE GEOGRAPHICAL DISTRIBUTION OF THE SPECIES.

BY GEORGE LEWIS, F.L.S.

The claws of *Sternocœlis* are stout and single on all the tarsi, but I only observed this character in March, when I had some living specimens to study for a few days. This character will hereafter serve well to distinguish the genus from *Hetærius*, in addition to the concavity common to the meso- and metasterna. The claws are short, and being robust, the speculation that they have gradually become connate might seem legitimate if I could see any sign of a suture, but as far as I can tell the claw is solid. *Eretmotus* also has only a single claw, and perhaps the enlargement of one claw in both cases has been the cause of the disappearance of the second. In *Hetærius* the claws are slender, each tarsus, like those of the majority of beetles, bearing two, and I see a similar structure in *Satrapes*, the genus which of all the *Histeridæ* most resembles it. In *Hetærius* and *Sternocœlis* the two basal joints of the antennæ are evidently connate, as a suture remains and shows the limit of each joint. As regards *Hetærius*, Dr. G. H. Horn has pointed out this, and has given us figures of the antennæ, but in the case of the claws in *Sternocœlis* it seems to me that either one has grown large, its growth causing the waste and final destruction of the other, or that at no period has there been a second, and that there is nothing available at the moment to guide any one to a solution of this problem. The other genera with single claws that I know of in the *Histeridæ* are *Monoplius*, which contains two curious species found in South Africa, and *Euclasea* from Central America.

It may be of interest if I add a few lines here on the geographical distribution of the species. The genus *Hetærius* contains nine species, all of which have been found at remote distances from each other in the temperate zone of the northern hemisphere. Of these three may be selected which are extremely similar to each other in appearance, viz., *ferrugineus*, *gratus* and *Blanchardi*, and they are natives of Europe, Asia and America respectively. So that it may be said that the genus is widely distributed, and contains species which are very similar to each other, although occurring in countries where the fauna generally is very dissimilar. Other genera can be called to mind, such as *Notiophilus* and *Loricera*, which have a like distribution, and the genus *Hetærius* will not, therefore, be considered peculiar in thus maintaining a general aspect over a large area. Not much is known about the species of the genus, as, with the exception of *ferrugineus*, all are rare, four being, I believe, unique in collections, but if we may be guided by *ferrugineus*, which has been found from London to Gibraltar on the west of Europe, and eastwards as far as the Caucasus mountains, we cannot consider it likely that the other species are very local.

But in looking into what is known of the history of *Sternocœlis*, we find no such corresponding details. It is a genus solely occupying countries whose shores are washed by the Mediterranean Sea; the species are numerous and very local, and sometimes three species have been found inhabiting one ant's nest. On the southern littoral of the Mediterranean, Oran, Algiers, Constantine, Phillipeville, and Bone, all have their peculiar species, while Tangiers, Tlemcen, the Island of Sicily, and Greece, are the localities of others, and it does not yet appear that their centres of distribution are much widened out. It is only at Tangiers and Algiçiras, where the water passage is narrow, that one species is found on both continents, and even then the commonest species in Morocco (*arachnoides*) has not been found in Spain. The species which is known to have the widest distribution is *hispanicus*, which has been taken abundantly near Lisbon, and occurs at Madrid (320 miles about). *Sternocœlis Marseuli* has as yet only been taken near the Escorial, and the other Spanish species (*fusculus* and *incisus*) are apparently local. In no case has any species been detected encroaching on the habitat of another, excepting in those instances in which several are found together.

Folkestone: *April* 19*th*, 1891.

PLUSIA BIMACULATA, STEPHENS, = *P. VERTICILLATA*, GUENÉE.

BY P. B. MASON, M.R.C.S., F.L.S., &c.

In the collection of the late Mr. Edwin Brown I found an insect with the printed label, "*bimaculata*," and a reference to its reception from Carter of Manchester. This had been placed under *P. iota*, and I have never closely examined it until the other day, when I received a specimen of *P. verticillata*, Gn., from Dr. Staudinger. This reminded me of the old specimen, and on comparing them I found them to be examples of the same species. On reading Stephens' description of *P. bimaculata*, there is no doubt that it is a good and sufficient description of the species named *verticillata* by Guenée.

To make sure of the correctness of the identification, Messrs. Kirby and Warren kindly examined the Stephensian collection, and discovered that the type specimen was not there, and Mr. Kirby told me that they did not possess a great many of the reputed British specimens of this collection, and suggested that my specimen might possibly be the type. Can any one put on record the fate of these reputed British specimens?; the box or drawer containing them did not go to the British Museum with Stephens' British collection.

Stephens' type specimen came from the Marsham collection, and was without locality.

Now, there is one record of the capture of *P. verticillata*, Gn. (*acuta*, Walker) in England, viz., that by Mr. H. P. Robinson, of Tunbridge Wells, in May, 1870.

The synonymy of this species must, therefore, be corrected as follows:—

PLUSIA BIMACULATA, Steph., Ill. Brit. Ent., Haust., vol. iii, p. 102.

P. verticillata, Guenée, Sp. Gen. Noctuél., t. ii, p. 344, No. 1168, 1852 (Knaggs, Ent. Annual, 1871, p. 79).

P. acuta, Walker, B. M. Cat. of Noctuæ, p. 922, 1857 (Robinson, Ent. Mo. Mag., vii, p. 138).

This species seems, like others of the genus, to have a very wide distribution, and there are specimens in the British Museum from many parts of Asia, from Africa, and from Australia.

Burton-on-Trent: *May*, 1891.

ON SOME NEW OR LITTLE KNOWN *COCCIDÆ* FOUND IN ENGLAND.

BY R. NEWSTEAD, F.E.S.

PLATE II.

DACTYLOPIUS WALKERI, *n. sp.*

♀ adult. Elongate, brown. Antennæ and legs pale yellow-brown, covered with a dense white powder; the white cottony appendages of the margin stout, six of these at the abdominal extremity longer and stouter than the others, the second pair longest and very stout, in length equal to the width of the body, the median pair short, composed of a much finer felting, are best seen from the under-side. Dorsum with numerous fine hairs and round spinnerets, the latter not raised above the surface; margin with a few hairs. Anal lobes normal, each with a medium sized hair and two or three shorter ones. Ano-genital ring with six long hairs, the intervening spaces with a row of extremely delicate hairs. Antennæ (fig. 7) of eight joints; 1st, 2nd, 4th and 5th in length nearly equal, 3rd two-thirds the length of the 8th, 6th and 7th shortest, equal, 8th longest, all the joints with many fine, long hairs. Legs (fig. 7d) long; femora and tibiæ in length equal, the former having a row of long hairs on the under-side; tarsi a little more than half the length of the tibiæ, both furnished on the upper and under-sides with a row of long hairs. Digitules simple, upper pair stoutest. Length, 2½—4 mm.; width, ¾—1½ mm.

Sac cylindrical, composed of delicate white cottony filaments; in the centre these become more felted. The whole structure, however, is very fragile, and can only be obtained in a perfect condition by placing the ♀ on the food plant and protecting it with gauze. Length, 6—8 mm.; width, 1½—2 mm.

Hab.: on *Agrostis vulgaris*, at Manley, Cheshire, September 5th to 9th, 1890.

I was only able to find about nine examples, although I searched unremittingly for several hours on many occasions. All occurred low down near the base of the plants, and when disturbed, they walked about much faster than any other *Dactylopius* I have seen.

The row of fine hairs of the ano-genital ring is abnormal in the genus; at least, I do not find any description of such by Signoret or any other author. When placed in potash this species gives off a rich dark crimson colour; in this respect it is like *D. indicus*, Sign. (Essai, p. 351), but differs in the form of the antennæ and in other particulars. It also differs from any other species that has the 8th joint the longest. So far this is the only indigenous representative of the genus.

I have much pleasure in dedicating this species to Mr. Alfred Ostend Walker, Nant-y-Glyn, Colwyn Bay, who for many years has kindly helped me in all my zoological studies.

ERIOCOCCUS INSIGNIS, *n. sp.*

♀ adult. Dark crimson,* elongate, oval; dorsum with a number of flanged, tubular spinnerets (fig. 5b), and very small round discs surmounted by an extremely small spine; margins with numerous strong spines. Abdominal lobes large, each with a single long hair and two or more short spines. Ano-genital ring large, with eight long hairs. Antennæ of seven (sometimes *six*) joints; of which the 3rd, 4th and 7th are the longest, 1st and 2nd stouter and shorter, 5th and 6th shortest; those with only six joints have the 3rd and 4th united, thus the 3rd becomes the longest (fig. 5); terminal joint with several long hairs (6 ?), there are also long hairs on the other joints, except the first, which is furnished with two short spines. Legs (fig. 5a) strong; tibiæ and tarsi equal, the former having two stiff hairs or spines placed together near the tibio-tarsal joint, one of them being longer and stouter than the other. Claw long and slender; digitules simple.

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* This applies to the desiccated ♀ only; I have not seen living examples.

Length of restored specimens, 2—3 mm.; width, 1—1½ mm.

Sac felted, white or yellowish-white, elongate, oval, slightly flattened, posterior half in some specimens distinctly segmented; abdominal extremity open.

Length, 3½—5 mm.; width, 1—1⅝ mm.

Contains an average of 170 pale yellow or straw coloured ova.

Hab.: on *Agrostis vulgaris*, *Rumex*, *Pteris*, and *Ulex*. Frequently in company (on the same leaf) with *Eriopeltis festucæ*, and more rarely with *Signoretia luzulæ*. At Ince, and Manley, Cheshire, August and September, 1890.

The seven-jointed antennæ are abnormal; in this respect it is like *E. Raithbyi*, Mask. (Trans. N. Z. Inst., 1889, p. 145), but it differs from the latter in the form of the antennæ, legs, and other important characters. The large sac will at once distinguish it from any other described species.

Some of the specimens recorded by Mr. Douglas (Ent. Mo. Mag., vol. xxiv, p. 166) from external characters only, under the assumed name of *Eriopeltis Lichtensteinii*, Sign. (previously *E. festucæ*, Sign., *nec* Fonsc.), have been kindly forwarded to me for examination, and prove to be identical with the above; but the species is generically different from that described by Signoret (*cf.* Ess. Cochen., p. 183, pl. viii, figs. 3, and *3a—f*).

ERIOCOCCUS FRAXINI, *n. sp.*

♀ adult. Bright red, subglobose; each segment above with a single row of flanged tubular spinnerets (fig. 6b), transversely arranged, and short scattered hairs, which are longer towards the abdominal extremity. Antennæ (fig. 6) of six joints, each successively shorter and narrower, except the 6th, which is about equal to the 2nd in length, and is furnished at the end with four or five slender hairs. Legs (fig. 6a) very short; femora with one very long hair; tibiæ and tarsi equal; claws rather long and slender. Digitules simple. Ano-genital ring very small, with six extremely small hairs. Anal setiferous lobes nearly obsolete, wide apart, each with a single medium-sized hair; near the lobes are several shorter hairs. Rostral filaments very long.

Sac variable, generally more or less circular, and obtusely rounded, composed of a very brittle white felting; the largest scarcely exceeding 1 mm. in diameter by ¾—1 mm. high, one of them often contains two or more individuals; it is, therefore, almost impossible to give the exact measurements of a single sac, and all the more, because many are generally packed close together.

♀ of the second stage pale red, or yellowish-red, narrowed behind; segments distinct; eyes piceous. In this stage it is only partly covered with a thin cottony secretion, the dorsum remaining almost bare. Antennæ, legs and ano-genital ring as in the adult

Hab.: in the cracks and crevices of the bark of the common ash (*Fraxinus excelsior*). Abundant on three trees at Ince, Cheshire, August, 1890.

The ano-genital ring with only six hairs, and the nearly obsolete abdominal lobes are abnormal, but I do not think these characters of sufficient importance to form a new genus. In these characters there are suggestions of the genus *Dactylopius*, but the forms of the sac and the antennæ at once separate it from this genus. Mr. Maskell states (Trans. N. Z. Inst., vol. xvii, p. 29) that *E. pallidus*, Mask., has "the ano-genital ring small, with eight (*sometimes six?*) fine, short hairs." I thought it just possible that the normal number might also occur in some of my examples, but a subsequent examination of many specimens proves, I think beyond doubt, that there are only six. It is, therefore, quite distinct from any other described species.

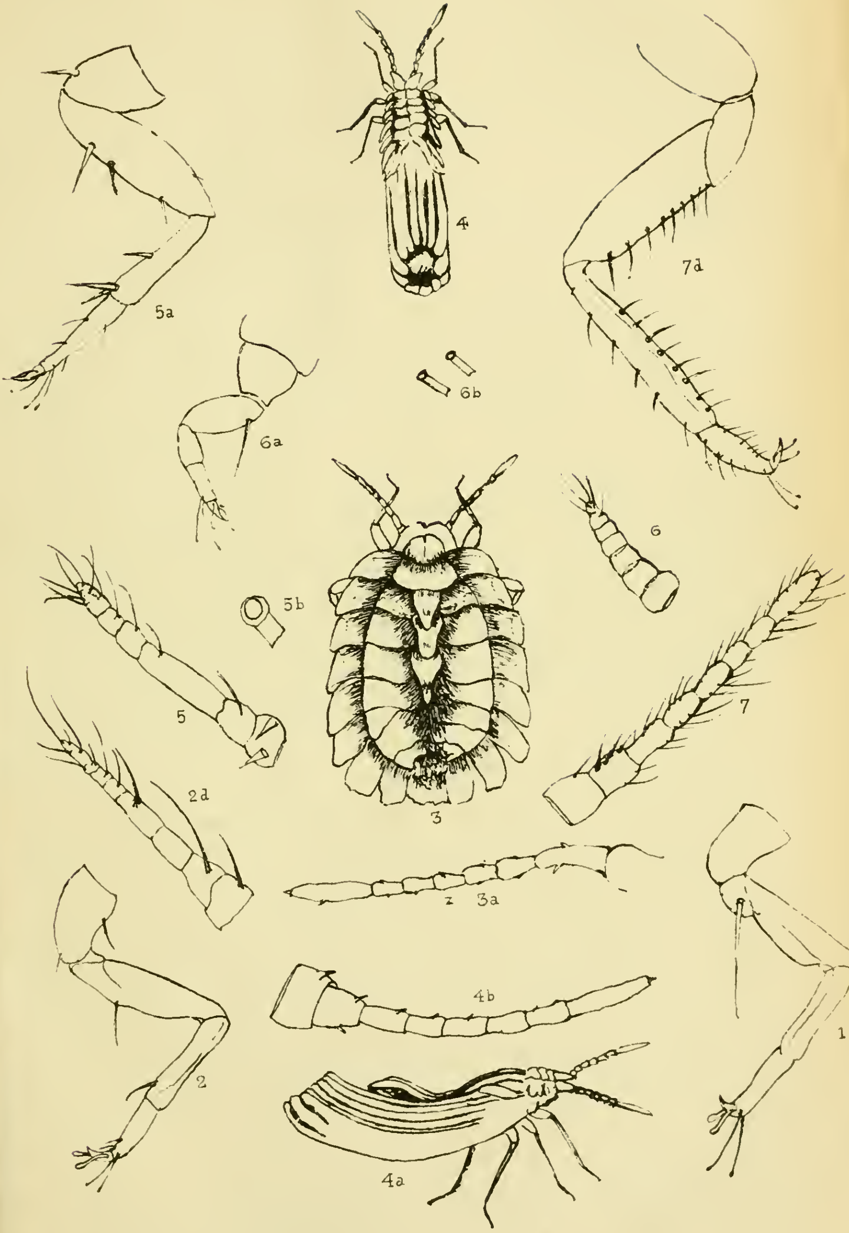
EXPLANATION OF PLATE II.

Lecanium hesperidum, ♀, fig. 1, leg.
„ *lauri*, ♀, fig. 2, leg.
Orthezia occidentalis, ♀, fig. 3, 3a, antenna.
„ *prælonga*, ♀, fig. 4, 4a, profile, 4b, antenna.
Eriococcus insignis, ♀, fig. 5, antenna, 5a, leg, 5b, dorsal spinneret.
„ *fraxini*, ♀, fig. 6, antenna, 6a, leg, 6b, spinnerets.
Dactylopius Walkeri, ♀, fig. 7, antenna, fig. 7d, leg.

Grosvenor Museum, Chester:
January, 1891.

Locusts as food.—From two widely different sources we have before us recent details as to the use as food of *Acrydium peregrinum*.

The first is an elaborate official report on the "Locust of North-Western India," by Mr. E. C. Cotes, of the Indian Museum. It is there stated (p. 6) that in certain districts the poor collected and boiled the locusts in salt water, obtaining, in this way, a supply of food both for themselves, and for their horses and camels, which eat the locusts, and are said to thrive upon them. The "Report" in question teems with information as to the ravages of the insect.



4
5a
7d
6b
6a
6
5b
5
3
7
2d
3a
4b
1
2
4a

The second is contained in a note sent by M. Künckel d'Herculais to the Entomological Society of France (Meeting of February 11th) on the ravages of the same species in Southern Algeria, in which it is stated that the natives are only too ready to aid in the destruction of locusts, because they use them as food, the occupants of each house or tent laying in a stock. They are first cured in salt and water, and then dried in the sun; they also form an article of barter. M. Künckel remarks that Strabo recorded a similar habit as existing in his time, in the same district, but then the locusts were crushed, salted, and formed into a kind of cake, which formed the chief food of the population.

Recent writers on locusts as food seem mostly to have forgotten the numerous citations by the Rev. F. W. Hope in a paper published in vol. iii of the First Series of Trans. Ent. Soc. London (1842), which probably mainly concern *A. peregrinum* and its American form or representative.

This reminds us that latterly we have heard nothing of the elaborate preparations once made by our friend Prof. Riley for utilizing the Rocky Mountain Locust (*Caloptenus spretus*) as food. We incline to the opinion that the "taste," even when they were cooked in the most tickling style of Parisian gastronomic art, proved an acquired one, and was easily, and not reluctantly, lost.—Eds.

A new species of Tortricidæ causing motion in seeds.—In the "Anales de la Sociedad Cientifica Argentina," Tome xxxi, pp. 97—110, February, 1891, Dr. Carlos Berg gives a lengthy review of the natural history and bibliography of *Carpocapsa saltitans*, Westw., of which the larva inhabits the seeds of *Colliguaya odorifera*, Mol., known as "jumping seeds;" and he adds the description of a new species of *Tortricidæ*, the larva of which lives in and on the seeds of another Euphorbiaceous plant, *Colliguaya brasiliensis*, J. Müll., a native of Uruguay, causing them to move in a manner similar to those tenanted by *Carpocapsa saltitans*, which he describes as *Grapholitha motrix*. There is a long account of the natural history and diagnosis of the moth.—Eds.

Larvæ of Abraxas grossulariata on Japanese Spindle-tree.—I was somewhat surprised yesterday to find a colony of the larvæ of *Abraxas grossulariata* on the terminal shoots of *Euonymus japonicus*, where they were busily engaged in devouring the young leaves. By the much-commended device of hand-picking I stopped the further development of about six dozen of them, but they have already left the young shoots as bare as the continued action of our long winter has effected on the unripened wood of last year, which, however, is withered past redemption. Kaltenbach states that he found the larvæ of this species on *E. europæus*, but I do not remember that they have been noticed on the Japanese plant. At Beaufort Gardens they devastated the currant bushes, as was natural and proper—for them; why they have spitefully followed me here, where there are no currants, and satiate themselves on foreign food, I know not.—J. W. Douglas, 153, Lewisham Road, S.E.: *May* 16*th*, 1891.

Late appearance of early-spring Lepidoptera.—On the 5th instant, owing, I suppose, to the retarded season, I met with *Anisopteryx æscularia* and *Amphydasis prodromaria* in excellent condition, at light. Some more seasonable visitors to the gas lamps on the same night were *Selenia illustraria*, *Coremia ferrugata*, *Melanippe* *fluctuata*, and *Anticlea derivata*.—R. M. Prideaux, 9, Vyvyan Terrace, Clifton, Bristol: *May 5th*, 1891.

Endromis versicolor at Reading—Yesterday, the 23rd, I was out among the birches after some *B. Parthenias*, ♀, which I wanted for eggs, when, what at first sight appeared to be a *V. Polychloros*, passed me, but after going over and about the tops of some fir trees, it was met by the strong east wind, when it altered the manner of its flight, and I recognised it as a moth; after following it for some distance I netted it, and it proved to be a fine male *E. versicolor*. To-day I visited the place, and saw another one, but failed to catch it. Again it looked like a large *Vanessa* coming towards me, but after I had struck at and startled it, it looked much more like a *B. rubi* dashing off, and although it was going dead against a rough wind, I could not overtake it. I searched the birch stems well for females, but without success; however, as this male is in such fresh condition, perhaps the female is not yet out. I have never seen the species here before, and do not think it has been recorded for Berks. — W. Holland, 111, Southampton Street, Reading: *April 24th*, 1891.

P.S.—On Monday, the 27th, after a long search, I found a ♀ *E. versicolor* hanging from the small twigs of a birch bush, and looking like a large dry leaf; it was quite low down, about a foot from the ground, just where it was best hidden by the dead fern and long dry grass. I fear though that it had laid its eggs before I found it, for it appears to be dying, and has laid me but one egg only.—W. H.

This afternoon I have found eggs of *E. versicolor* I believe. I have not been quite satisfied in my mind at missing the eggs of the female I found, so have been searching the birches near the spot several times. To-day I had another look, and found on a bush or two within about ten yards of where the female was, 49 large, purple-brown, oblong eggs, with a depression at top, just like the one egg laid by the female in the chip box. They were laid in little batches of from 6 to 12, in rows, on the small twigs of birch at the bottom of the bushes. Six of the eggs had hatched before I found them, but I could not discover the little larvæ anywhere; they certainly were not on any leaves very near their birthplace.—W. H.: *May 13th*.

Coleophora vibicigerella.—It is satisfactory to be able to report the re-occurrence of *Coleophora vibicigerella*. A friend and myself journeyed down to the Essex Salt Marshes on April 27th, with the particular intention of looking for hibernated larvæ of *G. smaragdaria*. In this, however, we were not successful, but, oddly enough, the very first plant of *Artemisia* examined produced the *Coleophora*, and about a dozen more were found within a few yards. The insect is exceedingly local, as Mr. Elisha has previously observed, for further careful search during the day proved fruitless. *C. vibicigerella* is no exception to many others of the genus, larvæ in various stages of growth being obtainable at the same time. The smallest of all now appear to feed only occasionally, and will no doubt pass another year before assuming the pupal state. Several of the larger ones have already spun up. On the Continent this species is reported to be attached to *Artemisia campestris*; possibly a careful search amongst that plant might produce *vibicigerella* more plentifully than we have it at present from *A. maritima*.—Geo. W. Bird, Honor Oak Park, S.E.: *May 18th*, 1891.

The oviposition and autumnal larva of Lampronia rubiella.—The egg of *L. rubiella* is laid when the raspberry is in flower; I have twice seen the process take place, and on one occasion besides saw it fail. The moth selects a fully open flower, and, without any prolonged examination, insinuates her terminal segments in the angle formed at the base of the stamens outside, between them and the calyx segments, seating herself on the stamens. The spear with which the ovipositor is armed pierces the substance of the receptacle in this angle, and the egg is placed in the substance of the receptacle at a depth from the surface about equal to its own diameter. On one occasion on which I saw the whole process it occupied about two and a half minutes; on the other the mother had some difficulty in extracting the spear after the operation was completed, and finally did so with a jerk—nothing of this sort occurred in the other case. The futile attempt was made by a moth on a not fully opened flower, which still had the calyx segments erect, and she sat outside them and tried to insert the extremity of the abdomen between these, but without success.

The egg is rounder than in *Adela*, *Micropteryx* or *Incurvaria*, but I have not got its measurements. When the raspberry is ripe and is removed by human or other agency, the larva of *rubiella* is in the fleshy white receptacle, but is ready to quit it, and does so immediately. In one such receptacle were two larvæ. So far as I could see, their presence does not interfere with the due development and ripening of the fruit.

The larva is nearly 3 mm. long, rather robust and fairly active; it reminds one very much of the larva of *Carpocapsa pomonella*, not only in its colouring, but in its general outline and proportions. The whole larva is, however, of a deeper tint, it is pink throughout and dorsally of a deep, bright pink; there is a very marked pink dorsal line from the 4th segment backwards. It is, indeed, very like, or decidedly smaller than, the larva that may be found in April in the buds or shoots that it kills.

The larvæ that I took were very unhappy in a glass jar, portions of raspberry stem, leaves of raspberry, and sawdust, gave them no comfort. A close search among the sawdust revealed somewhat later a larva contained in a very small cocoon; the cocoon is round and flat, an extremely oblate spheroid, or say cheese or lozenge-shaped, the silk white, very tough and dense, firmer and thicker round the margin, and the larva is so much larger than the cocoon, that it has to coil itself up in it marginally. The cocoon is 1¼ mm. in diameter, and barely ½ mm. thick.

If I have given the impression that the larva can only escape by the fruit being removed, I am wrong, as though the larva does not apparently despise this easier mode of egress, its proper proceeding is to make a hole in the base close to the footstalk. On its escape it no doubt proceeds to the base of the stem in the "stool" of the plant, and passes the winter in such a cocoon as that I have described, emerging thence in the spring, and continuing its life history as already well known.
—T. A. Chapman, Hereford: *May*, 1891.

Perilitus falciger; a parasite in a perfect beetle.—This very interesting species has been bred from *Timarcha lævigata* by the Rev. John Isabell, who boxed three beetles, brought to him at the Land's End by Mr. Cranford on March 30th. On examining the box the following day he observed that a number of larvæ had escaped from one of them, and on further investigation, it was found that forty-one altogether had left their host, twenty-three of which had spun up in slight white cocoons on the angle formed by the bottom and side of the willow chip box; eighteen, however, had not sufficient strength, or were injured by the occupants of the box, or may be the box was too dry for them. Of those that formed cocoons, nineteen emerged on May 1st and following days. On reference to Marshall's Monograph of the British *Braconidæ*, Part II, p. 76, he mentions that "A specimen exists in the British Museum, ticketted in the handwriting of F. Smith, 'the larva from a living *Timarcha coriaria*; and one specimen, a ♀, in the possession of the author, taken in Northamptonshire.'"—G. C. BIGNELL, Stonehouse, Plymouth: *May* 13*th*, 1891.

Aspilota concinna, Hal., bred from Homalomyia canicularis—I believe there is no record of the breeding of *Aspilota concinna*. I have, during the present month, reared them from an old wasp's nest, *Vespa vulgaris*, obtained last September near Plymbridge; out of the same nest I have also been breeding a great number of Dipterous flies, *Homalomyia canicularis*—on this species the little *Aspilota* was a parasite.—ID.

Raphidia cognata, Ramb., as a British Insect.—In the No. of this Magazine for Nov. last (1890, p. 304), I published a note under this heading, in which it is stated that I had seen "no *recent* British specimens." This still holds good; but there is some evidence to hand showing that at one time it was probably not uncommon. A few weeks ago the collection of British insects formerly belonging to the late Mr. W. Bennett, of Betchworth, was sold by auction. The *Neuroptera* were purchased by Mr. C. A. Briggs, and amongst them were two examples of *R. cognata*, one of which he has kindly given me. Mr. Bennett died a long time ago, and probably had done no collecting for long before his death. It may be that scarcely any specimens in the collection were less than from 40 to 50 years old. They were all on the characteristic old British pins never seen in comparatively modern collections. But if *R. cognata* was to be found in those days, why not now also?

In the same collection were two specimens of *Nothochrysa fulviceps*, Steph. This occured in almost all the old collections of British *Neuroptera*, and was apparently not very uncommon formerly. The few British specimens I possess came from old collections, contemporaneous with those that contained *R. cognata*. I may be wrong, but I do not remember any record of a comparatively recent capture. And yet it is a large and conspicuous "Lace-wing," and collectors of *Neuroptera* are more numerous now than they were formerly.—R. McLACHLAN, Lewisham: *May*, 1891.

Notes on a British Flea—Typhlopsylla assimilis, Tasch.—I have lately got a few specimens of fleas off shrew mice, voles, and common mice, and nearly all these appear to me to be referable to *T. assimilis*, Tasch., they have only the three genal spines as mentioned by Taschenberg, whereas *musculi*, Dugès, has four; the curious thing is, that I have not met with a single specimen of this latter, which appears in our list, whereas I have obtained fourteen or so of *assimilis*, which appears to be unrecorded. Taschenberg records his *assimilis* from *Sorex vulgaris* and *Talpa europæa*, *Mus sylvaticus* and *Arvicola arvalis*. Mine have occurred: four on

Sorex vulgaris (Sheffield and Woking), one on *Mus sylvaticus* (Woking), and seven on *Arvicola riparia*, Yarr. (Woking), and two at Ventnor, by shaking dead grass, &c., over a sheet, in pursuit of *Coleoptera*. *Musculi* is said by Taschenberg to infest *Mus musculus, agrarius, decumanus, rattus*, and, on Kolenati's authority, *Arvicola arvalis*. I have little doubt, therefore, that it is only because I have not had the chance of searching many true rats and mice that I have failed to meet with *musculi*. If any one has duplicate specimens of this, or of any of our British fleas to part with, I should be very grateful for them, and will make the best return in my power.—EDWARD SAUNDERS, St. Anne's, Woking: *May* 13*th*, 1891.

Homalota crassicornis at Buxton.—I have just received from Mr. Horner a ♀ specimen of *Homalota crassicornis*, Gyll., a species I did not previously know, but the first glance at it reminded me of some dark *Homalotæ* which I got at Buxton in June, 1889, under dead leaves in the Corbar Woods, and then referred to *pagana*. Only the other day I was examining these very specimens, and came to the conclusion that there was something wrong, and that they were distinct from my southern *pagana*, but I left them to examine more closely another time. I now clearly see, with the aid of Mr. Horner's specimen, that they are referable to *crassicornis*, and as Buxton is, I believe, a new locality for this rare species, I thought the capture would be worth recording. The obtusely angulated apical margin of the dorsal plate of the 7th abdominal segment in the ♂, as pointed out by Sharp, easily distinguishes it from *pagana*; and, as Mr. Horner remarks in his letter to me, the emarginate ventral valve of the 7th segment in the ♀ is equally characteristic of that sex. The antennæ in both sexes are very differently formed to those of *pagana*.

To be doubly certain of their identity, I have referred a ♂ and ♀ to Dr. Sharp, who has kindly examined them and returned them as correct.—ID.: *May* 14*th*, 1891.

Bruchus lentis, Boh.—A friend of mine in Lincoln has just brought me a quantity of specimens of this beetle, bred from lentils recently imported from Egypt; only three or four specimens have been recorded as British, and these are probably importations. Dr. Power is said to have taken one or two of them at Birch Wood, but it is probable that there is some mistake as to the record, or that they were taken in or near a house to which they had in some way been carried. It is most probable that the species ought to be struck off our lists as indigenous, but if so, there are many others among the corn and pulse feeding species that ought to share the same fate.—W. W. FOWLER, Lincoln: *May* 16*th*, 1891.

Coleoptera at Hastings.—The season is very backward here, many of the early spring beetles having only just made their appearance. I have, however, taken a few good things, the best of which are as follows. In Guestling sandpit, *Megacronus cingulatus*, *Plinthus caliginosus* (2), *Cœnopsis Waltoni*, and *fissirostris*. *C. Waltoni* has been fairly plentiful at Bexhill and Guestling in moss, but *fissirostris* I have only taken singly this season, whereas, a year ago, I took nearly twenty specimens. On the shingle at Pett I met with a few *Lymnæum nigropiceum*, but the most assiduous searching failed to produce more than five specimens. At Fairlight under *Lotus corniculatus*, *Sitones Waterhousei* turned up sparingly, in company with *Trachyphlœus squamulatus* and *Syncalypta hirsuta*. The latter insect seems to occur all over this district; I have found it in plenty at Hastings, Fairlight, Camber, Pett, Bexhill, and St. Leonards.

One of the most interesting finds has been that of *Hydroporus ferrugineus.* I first took a few specimens in June, 1889, in a small pool about a foot across, and last season it again turned up. This year my friend Mr. Ford, to whom I pointed out the locality, has taken it in some numbers by taking all the stones, &c., out of the pool. It seems strange that so rare an insect should be found in such a small quantity of water in numbers, considering that there is neither a stream nor pond within a mile.—W. H. BENNETT, 11, George Street, Hastings: *May 14th,* 1891.

Bledius crassicollis in numbers near Rye, Sussex.—For the past two seasons I have met with this species sparingly near Rye; it seems to occur most plentifully in May and June, at least, I have never been able to find it later in the year, so I thought I would spend a day hunting for it, and was rewarded by at last finding it in some numbers. I have always taken it on the banks of brackish ditches, and not far from the water's edge. It does not appear to burrow very deep, but lies in its burrow quite near the surface. I found a small species of *Dyschirius* associated with it, but it is apparently only *D. æneus.* On the sides of the same ditch, under vegetable refuse, *Actobius signaticornis* occurred sparingly, while *Limnichus pygmæus* was not uncommon on the mud.—ID.

Societies.

BIRMINGHAM ENTOMOLOGICAL SOCIETY: *April 20th,* 1891.—Rev. C. F. THORNEWILL, F.E.S., Vice-President, in the Chair.

Dr. Stacey Wilson was elected a Member of the Society.

Mr. R. C. Bradley showed *Lauxania cylindricornis* from Wyre Forest, and *L. ænea* from Trench Woods. Mr. A. Johnson showed larvæ of *Epunda lichenea.* The Secretary read a paper on "Urtication," which had been communicated by Mr. R. Freer. He described the effects which the hairs of *Porthesia similis, Bombyx rubi,* and other *Lepidoptera* in various stages, produced, and said that he concluded from them that the irritation was caused mechanically and not by poison. After describing in detail the hairs of the larva of *Porthesia similis,* and referring to the hairs of other larvæ, such as *Attacus Cecropia* and the *Pterophoridæ,* he said that careful study of these had convinced him that the hairs which caused the irritation were not true hairs, but degenerated weapons of offence and defence. A discussion followed, in which Messrs. Thornewill, Pope, Harrison, and C. J Wainwright joined.—COLBRAN J. WAINWRIGHT, *Hon. Sec.*

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY: *May 11th,* 1891.—The President, Mr. S. J. CAPPER, F.L.S., F.E.S., in the Chair.

Reports were read by the Secretaries of the District Records Committee, which showed that the lists were progressing, but the Secretaries hoped, in order to make them as complete as possible, that they would get the assistance and co-operation of all Entomologists who had done work in either of the two counties. A paper, "On the habits of some species of the *Hymenoptera-Aculeata,*" by Robert Newstead, F.E.S., was read, the author exhibited several cases of *Hymenoptera*, and two species of *Bombus*, *in situ*, stuck on thorns, said to be done by the Butcher Bird. The President exhibited *Cicada montana* from the New Forest. Mr. Stott, varieties of several species of *Noctuæ*. Mr. Day exhibited and explained a new setting board (Day and Newstead's Patent), which, by the use of glass slips, it is claimed the wings of *Lepidoptera* can be set accurately, and without disturbing the scales. The next meeting of the Society will take place on Monday September 14th.—F. N. Pierce, *Hon. Sec.*, 143, Smithdown Lane, Liverpool.

The South London Entomological and Natural History Society: *March 26th*, 1891.—W. H. Tugwell, Esq., President, in the Chair.

Mr. Skinner, of Putney, was elected a Member.

Mr. C. Fenn exhibited a long series of *Tæniocampa incerta*, Hufn., bred from ova obtained from a female at Lee, Kent, and remarked that the forms were mostly of very pale grey or brownish tints, banded with dark grey and purple, out of nearly one hundred that were bred, two-thirds followed the type; the pupæ had been exposed to the intense frost of the winter, and the moths emerged within a fortnight after the frost broke up. Mr. Tugwell, referring to Mr. Fenn's exhibit, expressed an opinion that a brood did not always follow the parent form. Mr. South remarked that in breeding *Lepidoptera* he invariably found the brood followed either the male or female form. Mr. Mansbridge exhibited a melanic specimen of *Phigalia pedaria*, Fb. Mr. South then referred to the supposed variety of *Pygæra curtula*, L., exhibited at a previous meeting by Mr. A. Robinson, and remarked that an analogous variety of *P. pigra*, Hufn., had been figured by Stephens and recorded by Mr. Whittick. An exhibition of microscopical objects was then given by members.

April 9th, 1891.—The President in the Chair.

Mr. A. H. Hamm, of Reading, was elected a Member.

Mr. H. Moore exhibited *Caligo Memnon* from South America, and *Metapodius sericollis* from Trinidad. Mr. South, three varieties of *Miana strigilis*, Clerck, which were extraordinary forms of the var. *latruncula*, and were received from Mr. Jeffreys, of Clevedon. Mr. R. Adkin, *Pædisca sordidana*, from Forres, and remarked that these were very unlike the specimens from N. Devon. Mr. Cockerell read a note on variation, and some discussion followed. Mr. S. Edwards contributed a paper on the *Papilionidæ*.

The Annual Exhibition was held on April 15th and 16th, at the "Bridge House," London Bridge, S.E., and comprised exhibits in nearly all groups of Natural History. The principal entomological exhibits were a fine collection of nests of British and Foreign Wasps by Mr. H. Moore and Mr. A. E. Cook. Mr. Billups showing *Hymenoptera*, *Heterogyna* and Fossorial, British *Coleoptera*, *Diptera*, *Hemiptera-Homoptera*. Mr. Lewcock and Mr. Goodman, cases of *Coleoptera*. Mr. W. Manger, Exotic *Coleoptera*, &c. Mr. R. McLachlan, British *Trichoptera* or Caddis Flies, with cases of the larvæ. Mr. W. West, *Homoptera*, collected in 1890. The most interesting exhibits among the *Lepidoptera* were those of Messrs. Tugwell, South, McArthur, J. H. Leech, C. S. Gregson, A. J. Croker, C.

H. Williams, Sydney Webb, Hawes, T. W. Hall, J. R. Wellman, Professor Stewart, Messrs. R. Adkin, J. Capper, C. A. Briggs, C. Fenn, A. H. Jones, J. A. Clark, J. W. Tutt, &c. A room was set apart for exhibition of living mollusca, collected in the neighbourhood of London, and of microscopical objects. Lectures were delivered each evening by Mr. F. Enock and Mr. G. Day.

April 23rd, 1891.—The President in the Chair.

Mr. E. Sabel, of Clapham, was elected a Member.

Mr. R. South exhibited a series of *Polyommatus Phlœas*, L., among which were examples of the vars. *Schmidtii*, Gerh., and *Eleus*, Fab., and some other interesting aberrations, together with representations of the species from Europe, Asia, and Africa. Mr. R. Adkin, *Emmelesia albulata*, Schiff., bred from pupæ received from Shetland in 1888, including var. *griseata*, Stgr., and var. *thules*, Weir; he also exhibited pupæ of *Cedestis Gysselinella*, Dup., in drawn-together fir needles, and larvæ of *Lithocolletis vacciniella*, Scott, both from Rannoch. Mr. Tugwell, *Larentia olivata*, Bork., from Portland. Mr. Billups, the three cabinet drawers of life histories shown by him at the Annual Exhibition; also pupa and imago of *Eulophus damicornis*, Kirby, bred from *Demas coryli*, L., by Mr. Symes, *Cetonia aurata*, L., showing the position of the species in the cocoon after its change from the larval stage, and, on behalf of Mr. Mansbridge, galls on *Hieracium* and birch, collected near Leeds.

May 14th, 1891.—The President in the Chair.

Messrs. H. Rowland-Brown, B.A., F.E.S., of Harrow Weald, G. Bird, of Honor Oak, F. E. Filer, of Southwark, G. W. Ruffle, of Camberwell, A. E. Dewey, of Walham Green, and A. C. Forrester, of Clapham, were elected Members.

Mr. Tugwell exhibited, on behalf of Mr. J. E. Robson, of Hartlepool, varieties of the under-side of *Lycæna Icarus*, Rott., and *L. Astrarche*, Bgstr., and *Vanessa Atalanta*, L., varieties of *V. urticæ*, L., *Cœnonympha Pamphilus*, var. *albescens*, &c. Mr. Tugwell also showed, on behalf of Mr. Collins, of Warrington, a dark specimen of *Aplecta nebulosa*, Hufn., an extremely dark form of *Acronycta rumicis*, var. *salicis*, Curt., and a variety of *Leucania lithargyria*, Esp. Mr. Jager, living larvæ of *Callimorpha Hera*, L., reared from ova obtained from a specimen captured in South Devon in 1890. Mr. R. Adkin, *Noctua festiva*, Hb., from Forres, Isle of Unst, North Wales, and Kent. Mr. Tugwell, bred forms of *Lobophora viretata*, Hb. The Secretary read a letter from Mr. Merrifield, and extracts from his papers on the effects of temperature on the colouring of certain species of *Lepidoptera*, the consideration of which stood over until a subsequent Meeting. Mr. Tutt contributed a paper, "Reproduction and Parthenogenesis."—H. W. Barker, *Hon. Sec.*

Entomological Society of London: *May 6th*, 1891. — Frederick Du Cane Godman, Esq., M.A., F.R.S., President, in the Chair.

Mr. Robert A. Dallas Beeching, of 24, St. James's Road, Tunbridge Wells, Kent; Mr. H. Shortridge Clarke, of Douglas, Isle of Man; Monsieur Léon Fairmaire, of 21, Rue du Dragon, Paris; Mr. Wm. Reid, of Pitcaple, Aberdeenshire; and Mr. Nelson M. Richardson, B.A., of Montevideo, Weymouth; were elected Fellows of the Society.

Dr. D. Sharp exhibited a number of eggs of *Dytiscus marginalis* laid on the sheath of a species of reed, and commented on the manner of their oviposition, which he said had been fully described by Dr. Régimbart.

The Rev. A. E. Eaton exhibited a collection of *Psychodidæ* from Somersetshire, including six species of *Psychoda*, eleven species of *Pericoma*, and one species of *Ulomyia*. Mr. McLachlan commented on the interesting nature of the exhibition.

Mr. P. Crowley exhibited a specimen of *Prothoë Caledonia*, a very handsome butterfly from Perak; and a specimen of another equally handsome species of the same genus from Tonghou, Burmah, which was said to be undescribed.

The Secretary read a letter from Mr. Merrifield, pointing out that the statement made by Mr. Fenn, at the meeting of the Society on the 1st April last, of his views on the effects of temperature in causing variation in *Lepidoptera*, was incorrect; he (Mr. Merrifield) had never suggested what might happen to *Tæniocampa instabilis*, and had expressly stated that he had found a reduction of the temperature below 57° to produce no effect, whereas in Mr. Fenn's experiments the temperature must have been below 40°.

The Secretary also read a letter which Lord Walsingham had received from Sir Arthur Blackwood, the Secretary of the Post Office, in answer to the memorial which, on behalf of the Society, had been submitted to the Postmaster General, asking that small parcels containing scientific specimens might be sent to places abroad at the reduced rates of postage applicable to packets of *boná fidé* trade patterns and samples. The letter intimated that, so far as the English Post Office was concerned, scientific specimens sent by sample post to places abroad would not be stopped in future.—H. Goss, *Hon. Secretary*.

ON OVIPOSITION, AND THE OVIPOSITOR, IN CERTAIN *LEPIDOPTERA*.

BY JOHN H. WOOD, M.B.

When I communicated the discovery made by Dr. Chapman and myself of the mode of egg-laying in *Micropteryx* (vol. i, ser. 2, p. 148), I had no idea how large the subject would prove, and that it would practically open up the whole question of ovipositing in Lepidopterous insects. We soon found, as had been suspected, that other genera in the *Tineina* besides *Micropteryx* and *Incurvaria* were able to penetrate plant-structures and deposit their eggs within; some selecting one part of the plant, and some another, whilst the instrument was modified to suit the kind of work it had to do. We next came upon a class of ovipositor very similar in outward appearance to the foregoing, and like them, rigid, yet highly elastic, and capable of being freely protruded. In form it was flat, broad, thin, and pointed, but in spite of its very lancet-like shape, it was incapable of cutting, and had evidently been designed to enable the insect to place its egg within an unopened floret; its form and rigidity being admirably adapted for insinuation between the closely lying coverings of the floret. Such an ovipositor occurs in the genus *Glyphipteryx*, and in many of the *Coleophoræ*.

Now, there was one curious point about all these instruments that struck both of us, which was that, freely as they could be protruded by the insects themselves, it was impossible to force them out by pressure on the abdomen, as can be done with ordinary ovipositors. It, therefore, seemed natural to conclude that the powerful rods with which they were provided, and which were plainly the agents through which protrusion was effected, would be peculiar to insects having rigid ovipositors; but happening to examine two or three species, all possessed of telescopic but soft ovipositors, I was surprised to find the rods present. This led to a wider examination, with the result that the rods were always found; and we must, therefore, conclude that they are present in all *Lepidoptera*, and are the handles by means of which the ovipositor and the last abdominal segment, or its equivalent, are worked. In insects with short ovipositors that scarcely reach beyond the abdominal outlet the rods are proportionately small and weak. In an insect, for example, of the size of *Melanippe montanata*, they are absolutely smaller than in *Adela viridella*, whilst in so minute a creature as *Micropteryx calthella* an ordinary lens would not be powerful enough to demonstrate them.

Early in the enquiry I came across an unexpected fact. It seems that all male *Lepidoptera* have eight external segments in the abdomen, but that their number in the female varies. In those with simple ovipositors the number is eight, as in the male, the ovipositor in the one case, and the male appendages in the other, making up the full complement of nine abdominal segments (Latreille's, or the 5th segment, being, to the best of my judgment, thoracic in the *Lepidoptera*). But in those with compound or telescopic ovipositors, composed, that is to say, of the ovipositor proper and the sheath, the number of segments is seven, the 8th having been converted into the sheath, and become intra-abdominal. As the steps of the operation by which the segment has been gradually changed into a sheath remain stereotyped for us in still existing forms, it may be as well to give them a moment's consideration. In the male insect, and in some of the other sex, the 8th is in all respects a typical abdominal segment. It is completely external; has its surface covered with ordinary scales, in addition to a frill of larger ones along the edge; and, further, consists of two separate plates, a dorsal and a ventral one. It is by no means a common female form, and though it appears to occur pretty widely among the *Geometræ*, and in some of the *Diurni*, I have not found it in any of the other great *Macro* groups, and have only met with it in the genus *Elachista* among the *Micros*. The first important modification, and one that I think includes the greater proportion of the female insect in, perhaps, all the great groups, consists in the fusion of the two separate plates into a single strong piece or ring, not always quite perfect, owing to the occasional presence of a narrow gap on the ventral face occupied by membrane alone. The ring is still wholly external, and is clothed and frilled with scales. A further advance follows from retraction of the ring, more or less under the 7th segment, and by the loss of all the scales but the frill. Nevertheless, the presence of the frill indicates that it has not yet quite lost its external character, but continues, as in the foregoing forms, to be part of the outer wall. Now, by retracting the part completely under the 7th segment, and by removing the last remnant of the scales, the change is completed, and it is transformed from an external segment to an internal one, or sheath, and becomes an appendage to the ovipositor; whilst the office of forming the abdominal outlet is transferred to the 7th segment. At the same time with its conversion into a sheath, it usually becomes longer in proportion to its width, and acquires the shape of a tube rather than that of a ring. As I shall have an opportunity later on, when describing the parts in individual insects, of dealing with some of the extreme forms of the sheath, I will content myself for the present with merely observing that it would be scarcely possible, without some such survey as the above, to recognise its true homologies, and that in all cases the sheath is, beyond dispute, the metamorphosed 8th segment.

Let us now briefly look at the homologies of the ovipositor. This organ consists of two distinct parts: one, inner and visceral, and the other, outer and skeletal. The visceral portion is a fleshy hyaline duct, a prolongation from the cloaca, and serves for the passage of the excrementa as well as for the delivery of the egg. The outer or skeletal part is the portion that has most importance for us. In the great majority of cases it may be described as a pair of chitinous plates, which embrace and take hold of the visceral tube, and are the means by which its protusion and retraction are effected. It must not, however, be concluded that the plates, though separate, are disconnected, for they are united to each other by membrane, just as are their homologues, the abdominal plates, so that, were the visceral tube removed, an outer or skeletal one would still remain. Moreover, as the plates themselves are merely chitinous deposits in this membrane,

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all I shall wish to imply, when speaking later on of the suppression of a plate, will be that the usual deposit has not taken place, and not that the membrane itself is absent. In a few insects, like *Elachista cygnipennella* (see figure *post.*), the plates are broad, substantial pieces, not so very unlike the plates of an abdominal segment, with which they are morphologically identical. In others, again, as *Coleophora cæspititiella* (see figure *post.*), they are long and narrow; whilst in one or two others of this genus, of which I have preparations before me, the plates are so narrow that they are barely as wide as their rods, and cannot well be distinguished from them. But in the great mass of insects these chitinous pieces are plates only in name, for they are broken up into fine lines or threads, which in some instances are armed with numerous cross spiculæ, and form very beautiful objects under the microscope.

Although the plates are, as I have said, identical with those of an ordinary segment, they are differently put together in the two cases. Taking an ideal segment to consist of four pieces, we find that in an ordinary segment the two upper pieces are united to form the dorsal plate, and the two lower the ventral plate; whereas, in the ovipositor an upper is united with a lower piece to form a lateral plate, the result of the combination being that the orifice of the ovipositor lies in a vertical plane, and not in a horizontal one as we should have expected from the general structure. But before dismissing this part of the subject, we must glance for a moment at the very exceptional state of things in the plant-cutters. We have just seen how attenuated the skeletal portion of the ovipositor becomes in very many insects, but in these others it undergoes quite an opposite change, and is developed into a single, but very large and powerful plate, fitted for cutting or piercing the tissues of plants. Its position is horizontal, with the visceral tube suspended from the under-side; and from this relation of the parts we must conclude that it represents the dorsal plate of an ordinary segment, the ventral plate having to all appearance been suppressed, or being represented in a few of them, as for example in *Micropteryx* by a pair of isolated pieces of chitine lying in the lower side of the wall of the visceral tube.

In the previous communication I spoke of the rods as dorsal and ventral. This is misleading, for their true relationship is with the segment as a whole, and not with a part of it. The one pair, which we will now call the outer pair, work the 8th segment or its equivalent, the sheath; and the other, or inner pair, work the ovipositor or 9th segment. The rods are to all intents and purposes prolongations of the plates, and owe their existence to the necessity of providing that the muscles which are attached to them, and on which the movements of the egg-laying apparatus depend, should have great length of fibre. For the muscles do not act on the principle of a lever, as in the limbs, but pull upon the part directly, producing simple protrusion and retraction, so that the amount of motion that is possible can be neither more nor less than the amount of shortening the muscles undergo on contraction, in the same way as an object is pulled in, measure for measure, by the shortening of the cord to which it is fastened. Consequently, in those cases where the parts have to be protruded freely the rods are proportionately long, while they are comparatively short under the opposite condition of things, and may even be absent altogether when the amount of protrusion is very trifling, or other means are taken for securing length of muscular fibre. Complete absence of the rods is, however, very exceptional. I have never met with it in the case of the inner pair which work the ovipositor, and for various reasons I much doubt whether it ever occurs with them; but here and there in one or two of the great groups the outer pair are suppressed. In some of the *Diurni*, as for example *Hipparchia Janira* and *Argynnis Euphrosyne*, they appear to be absent. The *Hipparchia* has the 8th segment converted into a ring, whose widest parts are at the sides, where the rods, if present, would have been attached. In the *Argynnis* the segment consists of a separate dorsal and ventral plate, the latter being narrow in the middle and wide at the sides, which reach back some way. Thus, by the same means, viz., lateral dilatation of the plate or ring, sufficient length for the muscles is obtained in both insects without the intervention of the rods. *Thanaos Tages*, the only other butterfly I have examined, does, however, possess the rods; but they are very rudimentary, and are merely short crooked processes, attached one at each corner of the ventral plate. Again, in the genus *Crambus*, so far as I have looked into it, the outer rods are also absent. Here the rather narrow sheath is closely connected with the gigantic apparatus concerned in impregnation, from which in all probability the muscles get their attachment. Perhaps I ought to say something about this apparatus. In *Lepidoptera* it is quite independent of the ovipositor, opening below it and further back; it is a most complex and remarkable structure, though it is only necessary here to speak of its external portion. This in its simplest form is a small, raised, chitinous opening, communicating with the abdomen through the intersegmental membrane uniting segments 7 and 8. Frequently it becomes a short canal by being prolonged forwards on the sheath or 8th segment; in other cases, again, it is developed into a huge plate reaching backwards under the 7th segment as far as its inner edge, and forwards to the outer edge of the 8th, with the underpart of which it is intimately united, the orifice being occasionally guarded by a flap, chitinous or leathery as the case may be; whilst the varieties and modifications of the several forms are infinite, and are likely to afford useful characters in determining closely allied species. In other genera of the *Crambidæ*, as well as in all the remaining great divisions, with the exception of the *Sphingidæ*, which I have had no opportunity of examining, the lower rods, so far as enquiry has at present gone, have always been present. Hitherto the rods have been considered as if they were always simple and unbranched bodies; but in many of the *Geometræ*, as in *Minoa euphorbiata* (see figure, *post.*), where the 8th is a typical abdominal segment, and consists of two separate and nearly equal plates, each outer rod divides into two, one branch going to the corner of the dorsal plate, the other to the corner of the ventral one.

No part of the investigation has been more puzzling than the muscular system connected with the rods. Actual dissection is next to impossible in the Micros, and in them one has to depend upon more or less accidental preparations; but in the larger insects it is not so very difficult to trace out the whole course of the muscles. They appear to be special developments of the ordinary recti muscles of the abdomen, and consist of two opposing sets, which may be called respectively protrudors and retractors, according as they push the parts out or draw them in again. Remembering that the main purpose of the rods is to secure great length of fibre for the muscles, it is not surprising that it is into the points only of the rods, where they are all crowded together, that the muscles are inserted, and that the shanks, however long they may be, remain free.

Let us now examine a large insect like *Triphæna pronuba*, taking the retractors first.

At the back part of each dorsal plate of the abdomen are a pair of transverse black lines, one on each side the middle line, marking the attachment of flat bands of muscle, the so-called recti, which retract and telescope the segments into each other. On the 7th segment, however, in place of these flat bands, there come off four roundish bundles of muscular fibres, two on each side, which pass downwards, and which are inserted into the points of the four rods, one bundle into each rod. Their action is to withdraw both ovipositor and sheath within the body, and from the circumstance of having a common origin, they probably act simultaneously. The ovipositor is furnished besides with its own pair of proper retractors that withdraw it within the sheath. They take their origin from the points of the outer rods, and each is inserted by two heads, not actually into the ovipositor itself, but into the membrane (intersegmental) connecting it with the sheath—one head into the part reflected on to the ovipositor, the other into the fore portion further outwards. I imagine that the last mentioned muscles act first and retract the ovipositor into the sheath, and that then the other set step in and, by a concerted action, withdraw both ovipositor and sheath within the abdomen.

Now, as regards the muscles that push the parts out.

There seem to be no special protrudors of the sheath, their place being supplied by the ordinary abdominal muscles that extend the segments upon each other. On the other hand, the ovipositor is provided with a pair of powerful protrudors. They spring from the inner surface of the sheath by a double origin—one from close to the middle line of the dorsum, and the other from further outwards, and are inserted into the points of the inner rods.

I have little doubt that the muscular system described above is, with some trifling variations, common to all *Lepidoptera* having simple ovipositors, or compound ones like *pronuba*, with little range of motion; but in compound instruments capable of great protrusion, such as we find in the plant-cutters, *Coleophoræ*, &c., the arrangement is, in many respects, different. The most striking difference, perhaps, is the presence of special protrudors of the sheath, to enable that body to take its fair share in the great extension to which the whole apparatus in these insects is subject. These muscles spring from the sides of the ventral plate of the 7th or last abdominal segment, far back, and are inserted into the points of the outer rods. Their demonstration is by no means easy, and I have only succeeded in obtaining them in an imperfect and fragmentary condition. In strong contrast to them in this respect are the protrudors of the ovipositor. These can be recognised at once, and are of great size, commensurate with the work they have to perform, but with nothing unusual in their attachments. The same may be said of the "proper" retractors of the ovipositor; but of the common retractors of the ovipositor and sheath, which pass from the points of the rods up into the abdomen, I have not been able (except in *Micropteryx*) to find a trace, many as have been the preparations I have made, and I can only come to the conclusion that they do not exist, at least in this form. When the great length of the rods in these insects is considered, and that they even reach in some cases as high as the 3rd abdominal segment, it becomes plain enough how inconvenient, if not impossible, it would be that retractors (allowing of the length of range required in these insects) should be inserted in the ordinary way into the points of the rods. Where, then, are we to look for them? To this I can by no means give a satisfactory answer. Let me, in the first place, say, that I feel nearly positive that the ovipositor has not a special muscle for drawing it back into the abdomen, in addition to its own proper one that retracts it within the sheath, for I have quite failed, after very careful search, to discover anything to which such an office could be assigned. Besides, seeing how intimate is the connection here between the ovipositor and sheath, and how important the sheath has become as an integral part of the egg-laying apparatus, it appears only necessary to provide for a special muscle for the withdrawal of the ovipositor as far as the sheath, leaving it to the latter organ to carry it along with itself into the body. But what withdraws the sheath? That is the crux. That it requires and is effected by special muscles can scarcely be doubted; and that the muscles must be inserted into the body of the sheath, since the rods are closed to them, is equally certain. Yet I have not been able to find them, or at least, to isolate them from the muscles which pass in and out of the sheath in connection with the movements of the ovipositor. I have often, however, been struck, especially in dissecting the *Coleophoræ*, with the great amount of muscle, broken and unbroken, connected with the sheath. The unbroken fibres, forming much the larger part, can be traced into the points of the rods, and named without hesitation; but the broken ones are more perplexing. I am tempted to assign them to the muscles we are in search of, their inner attachments to the abdominal wall having been lost by the removal of that structure in the course of preparation. There is yet one point observable in all the long-rodded insects, which ought not to be passed over, viz., the remarkable way in which the muscles surround the rods on all sides, encasing them, as it were, in a fleshy tube; an arrangement which not only gives direct support to these long and slender bodies, but also by insuring an even pull all round instead of a one-sided one, must prevent the bending which would otherwise almost certainly occur under the great muscular strain they have to bear.

I will now describe in detail a few of the instruments I have examined, and shall select them chiefly from the *Tineinæ*, purposely avoiding those in which the genital aperture is largely developed, because, as the latter much obscures the egg-laying apparatus itself, they are not so favourable for illustration. They all fall under one or other of two divisions, according as they are simple with the abdominal outlet at the 8th segment, or compound with the outlet at the 7th segment.

Elachista cygnipennella (Fig. 1).—I begin with this, not because it is a common form, for I have met with it nowhere but in the *Elachistæ*, but because it is the simplest and most easily understood of any I have come across. It belongs to the class of simple ovipositors. The 8th segment consists of a dorsal and a ventral plate; the dorsal, which is very deep and engages the greater part of the circumference of the outlet, receives the stout and slightly curved outer rod into its inner corners, no branches being sent to the comparatively shallow ventral plate. At the extreme inner edge of the ventral plate lies the genital aperture (g. a.), beneath a flat and very narrow arch of chitine. The plates of the ovipositor are large triangular pieces, to which the rods are attached about the middle of the posterior borders. Scattered over the surface of the plates, but congregated most thickly at their outer angle or nose, where, too, they are not so big, are certain long stiff hairs, springing from bulbous bases. They are organs of touch, no doubt highly sensitive, and are to be found in some part or other of all instruments, their usual seat being the ovipositor itself. I shall call them the tactile hairs.

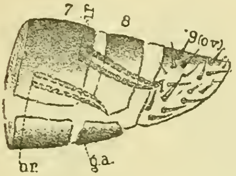

FIG. 1.

As we know that *cygnipennella* must place her eggs on the surface of the blades of *Dactylis glomerata* and other grasses, it seemed singular that she should be provided with so large and strong an ovipositor, and I was, therefore, led to try and discover her precise practice. I find that she avoids the fully expanded leaves, and selects one in which the sulcus running down the middle of the upper surface is not yet grown out, when, pressing her instrument in between the approximated sides, which must offer no inconsiderable resistance, and guided by the tactile hairs, she deposits her egg or eggs at the bottom of the trench. The egg is cylindrical and very slender, being nearly three times as long as broad, and slightly narrower at the tail end. It is usually laid singly, but occasionally three or four in a row overlapping each other.

Minoa euphorbiata.—This is another example of a simple instrument, showing among other things the division of the outer rods; a state of things which, I repeat, has only been found among some of the *Geometræ*. The dorsal and ventral plates of the 8th segment divide the outlet pretty evenly between them, and, to meet this condition, each of the outer rods splits into two, one branch going to the corner of the dorsal plate, the other to the corner of the ventral one (Fig. 3). The plates of the ovipositor are merely bands and

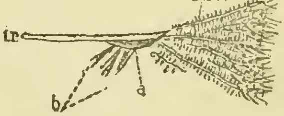

FIG. 2.

FIG. 1.—The last three segments of *E. cygnipennella*, with the ovipositor protruded i. r., Inner rods. o. r., Outer rods. g. a., Genital aperture

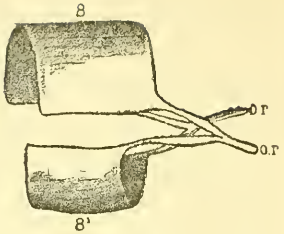

Fig. 3.

threads of chitine connected together by intervening membrane, and may be likened, from their structure and appearance, to an open fan. The broader pieces or bands are directly continuous with the rod, but the threads either spring from the bands or arise independently in the interspaces, as these become wider by the divergence of the bands. Numerous spiculæ come off at right angles from the bands and threads, and others are scattered sparingly over the intervening membrane; their office being, I presume, to supply the ovipositor with sufficient transverse rigidity. The inner rods are short and weak, and suddenly expand, before ending in the plates, into an oval-shaped piece, which affords attachment to a part of the proper "retractor" muscle of the ovipositor. The tactile hairs form a thick fringe along the outer edge of the plates, but their number rapidly lessens on the body of the plates, only a few reaching about as far as the middle. Their chief seats are the bands and threads, but some may also be found on the soft intervening membrane. They may be readily known from the spiculæ by their much greater length, their longitudinal direction, but principally by their large, granular-looking, and tubercular bases.

The substitution to a greater or less extent, of membrane for chitine in the ovipositor, of which the *Geometræ* afford an example, is the essential characteristic of the soft ovipositor, in contradistinction to the hard or rigid one: the former is almost universal, and is to be found from end to end of the *Lepidoptera*, in simple and compound instruments alike, whilst the latter is strictly exceptional, and confined, so far as I know, to some genera in the *Tineinæ*. I do not propose to describe other forms of the soft ovipositor. There are many of them, as may be conjectured from the various modifications to which its several parts can be subjected—for instance, in the relative proportion of the parts, in the presence or absence of the expansion for the retractor muscle, the number, form, and disposition of the chitinous ribs, with the presence or otherwise of the spiculæ, as well as in the general shape of the instrument itself. To attempt them would add unnecessarily to the length of these articles; and as I have also already entered sufficiently into the more common forms and modifications of the 8th segment, I may, therefore, pass at once to a consideration of the rigid, compound instruments, which, exceptional though they may be, are from their highly specialized nature more interesting and worthy of our attention. The simplest of them is the lancet-shaped instrument for probing unopened flowers, of which no

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Figs. 2 and 3.—One of the plates of the ovipositor, and the 8th abdominal segment in *M. euphorbiata*. a, Dilatation for the insertion of retractor muscle of the ovipositor. b, Torn muscular fibres.

more convenient example can be found than in the very common *Coleophora cæspititiella.*

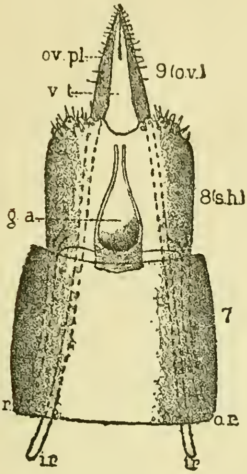

Fig. 4.

Coleophora cæspititiella.—Appearing at a time when the flower-heads of its food-plant, *Juncus conglomeratus*, are fully formed, yet not in actual blossom, the parent moth insinuates her thin, pointed ovipositor within the perianth of a floret, and affixes an egg to the inner surface of a segment. An examination of the floret usually shows that she lays two eggs before withdrawing her instrument, but places them on separate though adjoining segments in the same row; it depending upon the state of the flower at the time whether that be the inner or the outer row.

The sheath (8 (sh.)) is a complete tube, much flattened vertically, the better to match the thin and flat ovipositor, and has the rods, which are about half as long again as the sheath, inserted into the sides. A good idea of the relative length of the parts can be gained by stating, that when the sheath is fully protruded, the rods extend back into the abdomen as far as the inner margin of the 7th segment, this segment being a very large one, and equalling in length the 6th and 5th together. The sheath is strong, and of a rich amber colour below; but weak and watery-white above, where, to increase its strength, an amber coloured ridge or back-bone runs down the middle. Its mouth is provided with a straight margin on the upper-side, and on the lower is hollowed out in the centre into a large notch, from which there rises on either hand a broad, ear-like projection, with an indented outline, and dotted with long tactile hairs, that reaches round the side to the dorsal aspect. Instead of the usual cylindrical shape, the ovipositor is flattened into a very thin, blade-like instrument, in which the plates (ov. pl.) form a strong, amber-coloured, and rather narrow margin all round, whilst the centre is occupied by the soft visceral tube (v. t.). The mouth is a long slit, extending back from the tip for some distance, and opens laterally. In addition to the tactile hairs on the "ears" of the sheath, shorter ones are to be found on the margins of the plates of the ovipositor, especially towards their points. I have come across no insects so favourable as these "probing" ones for exhibiting the genital aperture. In *cæspititiella* it is a low, flat archway on the under-side of the sheath, at its inner extremity (g. a.). The arch, which is moderately deep, is a strong, chitinous structure, capable of resisting much pressure, and is firmly united to the sheath, whilst from its lower corners two distinct and converging elevations are continued down nearly as far as the notch, leaving only a very narrow channel between them for some little distance before their termination. The meaning of these elevations is not quite clear. They may be merely supports of the arch, on the other hand they may be of some special use in the pairing of the sexes.

Fig. 4.—Ventral view of last three segments of *C. cæspititiella.* ov. pl., Plate of ovipositor. v. t., Visceral tube. g. a., Genital aperture.

(*To be continued.*)

ON SOME NEW *HISTERIDÆ* FROM BURMAH.

BY G. LEWIS, F.L.S.

Mr. W. Doherty has very kindly sent me from Calcutta some *Histeridæ* collected by him at the Ruby Mines, Burmah, at an elevation of some 6—8000 feet above sea level, and I find amongst them five species which are evidently new and needing descriptive notice. There were also in the quill in which the whole came two species represented by single specimens. The locality in which these species were collected seems to be a very good one, as the captures are particularly interesting; the large size of the *Paromalus* is surprising, and one *Platysoma* is very fine.

1.—PLATYSOMA FOVEOLATUM, *n. sp.*

Ovatum, nigrum, nitidum; fronte, stria utrinque abbreviata; pronoto, ante scutellum distincte foveolato; elytris tristriatis; propygidio pygidioque grosse punctatis; prosterno haud striato; mesosterno læviter emarginato, stria integra distincte impressa. *Long.*, 7 *mm.*

Rather broadly oval, black, shining; forehead with a rather shallow and broad stria, bisinuate and shortened on either side, and not touching the outer margin in front of the eye; thorax with complete marginal stria, rather strong at the sides, feeble in front, especially behind the eye, transverse, with a very distinct fovea in front of the scutellum; elytral striæ 1—3 complete, the 4th consists of one or two points only at the apex; propygidium is depressed on both sides, where it is strongly punctate, in the middle the punctures are fewer; pygidium closely punctate, punctures ocellated, external edges elevated; the prosternum is not sculptured; the mesosternal stria is complete, leaving the anterior margin rather wide. Anterior tibiæ 4-dentate.

This species belongs to the same group as *atratum*, Er., and *ovatum*, Er., but it is much broader than any species in the section, and the scutellar fovea is very conspicuous.

2.—PLATYSOMA LUCILLUM, *n. sp.*

Oblongum, depressiusculum, brunneum nitidissimum; fronte læviter impressa; pronoto impunctato stria valida integra; elytris striis 1—4 *integris* 5^a *basi late abbreviata; propygidio pygidioque grosse punctatis; prosterno haud striato; meso- et metasterno lævibus; antennis pedibusque rufis.*

Long., $2\frac{1}{2}$ *mm.*

Oblong, reddish-brown, shining; forehead lightly impressed, not punctured, stria well marked and nearly straight; thorax smooth, with a complete stria, lateral interstice rather narrow; elytra 1—4 striæ complete, 5th much shortened before the base, and it is quite parallel to the suture. The sutural stria is wanting, the interstice between the suture and the fifth stria is a very little wider than the interstice of the 4th and 5th striæ; the propygidium is wholly covered with large punctures evenly set; the pygidium has punctures irregularly dispersed, most thickly set at the base and easily counted as 21 or 22. Prosternum without striæ; mesosternum very slightly emarginate in front, marginal striæ clearly defined and continuing down the side of the metasternum. All the sternal plates are impunctate.

3.—HISTER VESTITUS, *n. sp.*

Breviter ovalis, niger nitidus; pedibus piceis; fronte stria integra; elytris striis 1—4 *integris,* 5—6 *apicalibus; prosterno mesosternoque dense vestitis; metasterno lævi.* *Long.*, 3—3¼ *mm.*

Oval, black, shining, antennæ and legs piceous; frontal stria transverse, moderately impressed, very slightly sinuous; head and thorax very finely and sparsely punctulate; thorax with marginal stria very fine, terminating behind the eye, lateral stria oblique, rather strong, turning towards the outer margin as it approaches the base, it continues behind the neck, where it is feeble and a little crenulate, and at the eyes it is feebly sinuous; elytra, striæ 1—4 complete, 5th and sutural apical, the sutural reaching the middle of the dorsal region, the other is shorter. The interstices of the 1st and 2nd striæ and the 3rd and 4th striæ widen out a little at the base. The propygidium and pygidium are evenly but a little sparsely punctured. The prosternum and mesosternum are clothed with a very singular growth, which, under the microscope, appears to be composed of cinereous hairs. The growth naturally entirely obscures the sculpture of these parts, but in an abraded specimen the prosternum and mesosternum seem to be roughly punctured or granulate. The metasternum is smooth and impunctate, and the contrast in the appearance of these surfaces is very remarkable. The anterior tibiæ are rather dilated near the tarsi, and bear, when not abraded, a cluster of small denticulations, the other tibiæ are multispinous.

The superficies of this species resembles *myrmidon*, Mars. I have seen eight specimens of it.

4.—PAROMALUS GOLIATH, *n. sp.*

This species belongs to that section of the genus in which the males have an abdominal tubercle.

Ovalis, niger, nitidus, punctulatus; capite stria integra; pronoto ante scutellum foveolato; elytris striis obsoletis; pygidio subopaco tenuissime punctulato; prosterno bistriato; mesosterno immarginato, stria transversa biangulata. *Long.*, 4¾—5½ *mm.*

Oval, black, and shining, above evenly and rather thickly punctulate; forehead flattish, with marginal stria well marked and complete; thorax with conspicuous scutellar fovea and outer stria complete; elytra with dorsal striæ obsolete, apex margined by an epipleural stria being continued round it to the suture; propygidium and pygidium somewhat opaque, with almost imperceptible punctulations. The anterior lobe of the prosternum is punctate, the keel bistriate, striæ joining behind only and in front terminating abruptly at the suture. Mesosternum (not distinct from the metasternum) with a shallow, biangulate, transverse stria divided into three nearly equal parts; ♂ metasternum with a large three-sided depression at its base, the first segment of the abdomen is also depressed anteriorly, and has a well-defined ridge-like basal tubercle. Anterior tibiæ 4-dentate, intermediate spinose, posterior with two or three spines near the tarsi. ♀ is without the metasternal depression and abdominal tubercle, but it has sexual distinctions somewhat variable in the pygidium. The disc of the pygidium is deeply excavated, generally in the form of two loops, slightly oblique to each other, with the intermediate surface irregularly rugose and punctate. On the under-side of the pygidium also in the centre is a small transverse excavation.

5.—TRYPONÆUS DOHERTYI, *n. sp.*

Cylindricus, niger nitidus; rostro triangulato margine elevato; pronoto sparse punctulato; prosterno truncato, punctato, utrinque striato; mesosterno antice recto haud producto. *Long.*, 4½ *mm.*

♂ cylindrical, black, very shining, snout triangular, elevated at the sides with a median longitudinal impression, lightly and unevenly punctulate; thorax about as long as the elytra, both evenly but not thickly punctulate, triangularly sloped in front, with a tubercle or little ridge behind the neck, and two lesser elevations behind it at the point where the anterior slope begins, the lateral stria is complete; elytra lightly impressed round the scutellum; propygidium and pygidium sparsely punctulate, the latter clothed sparingly with greyish hairs; anterior tibiæ with five or six strong teeth. ♀. Thorax anteriorly convex, with the anterior angles subfoveolate, and the upper-surface is more distinctly punctured, especially the pygidium.

Beneath, prosternum rather roughly not closely punctured, the keel truncate before and behind, corners rectangular, striate at the sides; mesosternum truncate in front, widening out behind the anterior coxæ, marginate laterally. ♀ has the metasternum and first ventral segment distinctly punctured, in the ♂ these are only finely punctulate.

Folkestone: *March*, 1891.

ON TWO NEW SPECIES OF *ANTHICIDÆ.*

BY G. C. CHAMPION, F.Z.S.

TOMODERUS DENTICOLLIS, *n. sp.*

Elongate, narrow, parallel, reddish-testaceous, the elytra flavo-testaceous, with the scutellar region infuscate (perhaps owing to discoloration), the upper surface shining and finely pubescent. Head with a few widely scattered minute punctures, the eyes black and very coarsely granulated; antennæ entirely testaceous, stout, fully reaching to the middle of the elytra, the penultimate joints transverse; prothorax slightly broader than long, very strongly constricted at the sides behind the middle, and with the usual deep transverse groove across the disc before the base, the anterior portion canaliculate, and at the sides denticulate, the teeth fine but distinct, the posterior one longer than the others (the lateral constriction, in consequence, appearing very abrupt and deep), the surface with minute scattered punctures; elytra long and narrow, parallel, with irregular rows of closely placed, moderately coarse, punctures, which become much finer and shallower towards the apex; legs flavo-testaceous. Length 1½, breadth ½, mm.

Hab.: N. W. AUSTRALIA, Adelaide River.

A single specimen of this interesting new species of *Tomoderus*, the first of the genus recorded from the Australian continent, has recently been forwarded to me by Mr. J. J. Walker. In the denticulate lateral margins of the thorax it differs from all others of the genus yet described; but parallel forms are known in the genus *Anthicus*, *e. g.*, *A. spinicollis*, *A. æquinoctialis*, La Ferté, &c. The species is allied to *T. compressicollis*, Motsch.; but it is very much smaller and narrower than that insect, and has the elytral punctuation much finer, closer, and less regularly arranged. *T. brevicollis*, La Ferté, from India, appears to be still more nearly allied, but, to judge from the description, has the thorax formed as in *T. compressicollis*; *T. vinctus*, Er., from Tasmania, differs in numerous particulars from *T. denticollis*.

MECYNOTARSUS TENUIPES, *n. sp.*

Moderately elongate, testaceous; the elytra piceous, with the sides towards the base broadly and indeterminately, and a large rounded spot on each at the apex (confluent with the one on the opposite elytron at the suture), testaceous; the upper-surface thickly clothed with very fine, silky, appressed, whitish pubescence, the prothorax with a few very long hairs at the sides and beneath the horn. Head densely and minutely punctured, flattened between the eyes, the latter black; antennæ entirely testaceous, exceedingly long and slender, filiform, extending fully to the apex of the elytra; prothorax transversely convex, strongly and abruptly constricted at the sides behind, and with a shallow transverse groove across the disc just before the base, the surface densely and minutely punctured (the punctuation quite hidden by the pubescence)—the horn long and broad, furnished with seven strong teeth on either side, and with a broad projecting piece at the apex, the crest moderately raised and sharply margined on either side, the margin serrate, the surface of the crest and horn coarsely punctured, the crest without median carina; elytra convex, truncate at the base, widest at the middle, and slightly narrowing anteriorly, the sides subparallel in front, the shoulders broadly rounded, the surface with fine, deep, scattered punctures, the punctures subserially arranged towards the base and becoming very much finer towards the apex, the interspaces with an exceedingly minute punctuation (only visible under a very strong lens); legs pale testaceous, exceedingly long and slender, the tibial spurs long,

Length (from tip of thoracic horn to end of the elytra) 2½, breadth ⅞, mm.

Hab.: JAPAN, Urasa, between Niigata and Nikko.

One specimen, captured by Mr. G. Lewis on September 19th, 1881. This very distinct species may be at once known by its exceedingly long and slender legs and antennæ. It is the second recorded *Mecynotarsus* from Japan.

11, Caldervale Road, Clapham, S.W.:
May 4th, 1891.

CASE-MAKING COLEOPTEROUS LARVÆ.

BY T. D. A. COCKERELL, F.Z.S.

On April 23rd, 1890, at West Cliff, I came across numerous little earthy cases, cylindrical, rounded posteriorly, and subcarinate dorsally, in the nest of an ant, apparently *Formica fusca*. Each of these contained a fleshy Coleopterous larva, with rugose head; in colour pale orange, with the head and tarsi red-brown.

I at once sent one of these to Dr. John Hamilton, who wrote on April 28th that they were "very probably the larvæ of *Coscinoptera vittigera*, which is found in Colorado. The larvæ of *C. dominica* construct such cases, and hibernate as larvæ under stones, &c. I thought all the species of *Clythrini* and *Chlamydini* were leaf-eaters (phytophagi), but I find *C. dominica* lives on the ground and eats dead leaves, and likely this larva does the same. I have the one you sent me in a tin box with an old leaf in it, and it appears to be eating quite lively; possibly I may raise it. Observe whether its being with ants was an accident (as I think) or whether from its nature. Professor Riley, Missouri Rep. 6, figures the eggs, larvæ, case, and imago of *C. dominica*, also the case of *Chlamys plicata*, either of which would do, as to shape, but the details are a little different."

So I made further search, and as a result found a second species, living on the same bank, but doubtless distinct. This latter did not live with ants. The two larvæ may be distinguished by the following table:—

COSCINOPTERA No. 1.	COSCINOPTERA No. 2.
Lives in ants' nests.	Lives under rocks, but not in nests.
Case, 7½ mm. long; greyish, carinate dorsally, and with more rudimentary lateral carinæ.	Case, 4 mm. long; blackish with no indication of carinæ.
Larva pale orange; head, tarsi, and thoracic shield red-brown.	Larva white, with a strong pinkish-yellow tinge; head and legs black; thoracic shield dark brown.

Structurally, both species seem generically identical; they also walk in the same way.

I have found *Coscinoptera vittigera* and *C. axiliaris* in the perfect state in the neighbourhood of West Cliff. *Babia quadriguttata*, Say.,* I found on *Yucca angustifolia*, Pursh, at the same locality as that of the larvæ; may my larva No. 2 have been this?

I believe, myself, that larva No. 1 lives normally with ants (since

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* *C. vittigera* was kindly identified for me by Mr. L. O. Howard, from a specimen found by Swift Creek; the other two species were identified by Dr. Hamilton.

I always found it so), and possibly the case-making habit may have been acquired in this group as a protection against the bites of the ants. *Microdon*, a genus of *Syrphidæ*, of which I found a new species,* in the pupal state, in a nest of *Formica integra*, at West Cliff, has a stronger pupal covering than most of its family ; and the *Histeridæ*, some of which live with ants, are very well protected by their curious structure. By being able to live in ants' nests, and protected from the ants themselves, no doubt these insects obtain a much greater immunity from attack by birds, lizards, and other enemies, and are thus benefitted. Many such enemies would not venture to attack a nest of ants ; and those who might do so, would very easily overlook these *Coleoptera* or *Diptera* in the multitude of hurrying ants.

3, Fairfax Road, Bedford Park,
Chiswick, W.: *April* 21*st*, 1891.

NOTE ON THE LIFE-HISTORY OF *ADELA RUFIMITRELLA*.

BY T. A. CHAPMAN, M.D., F.E.S.

In the "Natural History of the Tineina," Stainton says, "the egg is laid *in* or *on* the pods of *Cardamine pratensis*, and *Sis. alliaria*, and the young larvæ, no doubt, feed on the contents of the pods, when they quit the pods they descend to the ground and construct flat bivalve cases." This is, no doubt, a remarkable instance of how near a man of great insight may come to a knowledge of some interesting or unusual fact, and yet just miss it ; since it appears to be certain that he had no idea of the possession by the moth of a piercing apparatus by which the moth does lay her eggs *in* the pod, and yet, wise after the event, we wonder how he could suppose the eggs to be laid *in* the pod, without some such apparatus. Last year I found the eggs *in* the pods, and traced the larva thence to its appearance on the ground in a case. This year I have succeeded in seeing the moth in the wild state laying her eggs. The interest (to me) in this case, as in that of *L. rubiella*, being chiefly in connection with the habit of the moth as a "spear-tail." I hope Dr. Wood will give us some details of the anatomy of the "spear" or knife in this as in the other species he has investigated.

This spring I found *A. rufimitrella* abundant among *Cardamine pratensis* (I never see it on *S. alliaria*), in a conveniently near meadow, and on May 29th and 30th saw the moths *in cop.*, and observed several ♀s ovipositing. The moth when so engaged, walks from one pod to another, on reaching the pedicel of the new pod she walks slowly up it, trailing the abdominal extremity, fringed in all these species with tactile hairs, along its surface as she proceeds, now and then halting a moment as though about to oviposit in the pedicel. It is not, however, till she reaches a point about one-tenth of an inch up the pod that she actually does so. She then adopts an attitude, with the head towards the upper end of the pod, raised as high as the full length of the tibiæ and tarsi of the fore-legs will allow, the tips of the wings touch the pod, the abdominal extremity, which, were the moth at rest, would in this attitude be hidden between the wings at some distance from the pod, is bent down so that it meets its surface at almost a right angle. It is not, however, specially bent down at the moment, but has been maintained against the surface of the pod during the walk up the stalk and pod, and it has obviously been by its tactile sense that the proper spot has been selected. The actual oviposition takes from 40 to 60 seconds. When the pod is long enough the moth generally crawls further up and makes one or two further layings in the same pod.

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* Not yet described : the type specimen, with pupa-case, is now in the British Museum.

On opening the pod, two or even three eggs may sometimes be found at the same place ; from noticing on one occasion that the two eggs so placed side by side were not of apparently the same age, I incline to think that the moth only lays one egg at each place, and that two or more eggs together mean that two or more layings have been made at the same place by the same, or, more likely, by different moths.

A pod examined immediately the moth has laid shows externally only the faintest longitudinal mark that one is doubtful about, till opening the pod and finding the egg within confirms the observation, so slight is the damage done by the incision, or so rapidly is it repaired. The position is in the margin of the dissepiment, close to the margin of, but not in, the dehiscent plate.

The pod selected is usually about half inch in length, with seeds not much larger than the egg of the moth. A moth was seen apparently ovipositing in a pod a quarter of an inch long, but no egg could be found within, and there was in fact no cavity within sufficient to contain an egg, as the moth had probably discovered.

When laid, the egg is 0·46 mm. in length, and 0·16 in width, of an ovoid shape, that is, narrower at one end. After some days the egg grows to a length of 0.60 mm., and a width of 0.28 mm., the shape is now more distinct, and may be called pear-shaped, the narrow end having a collar or neck. The development of the young larva within is easily seen ; when the egg has attained the full size noted (by absorption of fluid ?), the young larva is to be seen within coiled or rather doubled up within an interior membranous, nearly globular sac, the ends of the egg proper containing clear fluid. The nuclei of the cells forming the egg shell may be noticed, but it has no other sculpturing except a few radiating lines, marking the micropyle at the narrow end.

In 1890, the eggs hatched about June 10th ; on June 17th the larva was 1·6 mm. in length, eating the seeds and dissepiment, on the 22nd it had moulted, and was 2·2 mm. in length ; head and six legs of ordinary Lepidopterous type, with well-developed palpi, and other mouth parts, various hairs on head, and a series of lateral hairs, two on each side of each segment, no distinct prolegs ; interior anatomy very easily seen, owing to transparency, skin under a higher power, beautifully shagreened with rows of raised dots.

It is still apparently in this second skin when it is set free and becomes a case-bearer ; this took place on June 28th. It is set free by the natural dehiscence of the pod, the two lateral plates falling off in the cruciferous manner. The larva has provided for this contingency, and already inhabits a case. The greater part of this case consists of the husk of one of the seeds, so divided that a half forms either side of the case, but not being large enough in one example drawn, is supplemented by silk and frass at both ends, and along one margin, the length of the husk being something over one mm., and that of the case nearly two. By July 30th, the cases were 3½ to 4 mm. long, for want of other material they were made of silk, frass, and leaf chips; the larvæ being fed on leaves of *C. pratensis*, which they eat freely. They became apparently full grown in September, having cast their skins at least twice. I lost them during the winter, having let them dry up. It may be desirable to explain that the successive stages were not those of one individual larva, but of specimens obtained at each date by opening a fresh pod, so that the dates are not strictly accurate, if read for one individual, still, as all the egg laying is done in a day or two, the different larvæ must be very nearly of an age.

I may also remark that in commencing my observations I was bothered by the ova of a Curculio (I think) about the same size as those of *rufimitrella*, nearly spherical, and laid, not in the cavity of the pod, but in the substance of the dissepiment. In this case just a trace of the place of oviposition is discernible externally.

Firbank, Hereford: *June*, 1891.

ON THE NESTS OF *OSMIA BICOLOR*, SCHK.

BY V. R. PERKINS, F.E.S

In vol. xxi, pp. 38 and 67, of this Magazine, I drew attention to what I considered was a very curious habit of *Osmia bicolor*, Schk., a habit, I believe, quite peculiar to this one bee, that of picking up dry bents of grass or stick, and flying away with them in its mandibles. It is only the female that does this, and I concluded at the time I first noticed it that it must have something to do with nidification, but in what way I was at a loss to know. This bee is known to make use of old shells of *Helix nemoralis* for its nidus. These it fills with its cells, and I have seen the bee right inside the whorl of this shell busily at work, and so captured it, but I have never seen any symptom of stick or bent connected with it, so it was a puzzle what the bees did with them.

This present season, notwithstanding the very severe winter and continued cold spring, these bees were out and about quite as early and as numerously as usual, and by the middle of April they had become plentiful. I was too much engaged with other matters at that time to go and look after them, and it was on the 6th of this present month that I was able to get away to one of the spots where these bees can be watched attentively, and where I was not likely to be disturbed. I found the females in abundance, and they were at their old game, so now was my opportunity. I saw them alight on the ground, search about and select a bent, and then fly off with it. I was determined to solve the mystery, if possible, so I crept about on my hands and knees watching intently the bees flitting along the dry sunny bank, working in and out among the short herbage, and soon I saw one start up under my very nose, and I saw also a little pile of bents collected into a heap, just such as the bees select. It struck me as a very peculiar looking mound, and I took up the lot in my hand, when what should I see under it but a *Helix* shell full of cells of the *Osmia*. Here, then, was the explanation of the mystery, plain enough. These bees, when they have filled a shell full of cells, set to work to cover it over, to hide it both from the sun's rays, and from any birds, mice, insects, or other enemies that might chance to come across it. Having so far succeeded, I made up my mind to return the next morning and prosecute my studies further in the same direction. I soon found another of these peculiar little constructions, so I sat myself down by it and watched to see what would occur. I was close enough to take it up if I wanted to, but the bee came with her load, perfectly indifferent to my presence, and deposited it in her own peculiar way and to her own satisfaction, and then went away for another; she worked hard, and brought them in rapidly one after another, with each one she would alight on the top of the mound, then look round, walk over it, and with her jaws push one of the ends into the heap where she wanted it to remain, and so fix it; as soon as she was satisfied with its position off she went for another, brought it in, and did exactly the same, every bent was put in its proper place, and she never laid one simply down on the top while I watched her.

These nests very much resemble those of *Formica rufa* in miniature, they are from four to six inches round the bottom, and are from two to three inches high, so that they are very easily detected when you once know what they are, and the labour spent upon them must be very great, for there are hundreds of bents in each, and each one is brought and added separately. I found some dozen or more, all within a short distance, and three so close together that I could watch the proceedings of them all at the same time. This furnishes a complete history of the habits of this wonderful little *Osmia*.

Wotton-under-Edge:
May 13*th*, 1891.

Aculeate Hymenoptera in S. Devon.—The spring bees and other Aculeates have so far been very scarce this year. Neither the sallow nor the blackthorn blossom produced a single species worth catching. In April I found a single *Halictus xanthopus*, Kirb., ♀, which was stylopized. I have not previously noticed it so attacked. *Andrena minutula*, Kirb., was also taken so affected for the first time.

On the cliffs round Stoke-Fleming workers of the small ant, *Leptothorax unifasciata*, Ltr., ran over the shale in the hottest sunshine. I also found their nests, which were formed in cracks between the flakes of shale. The number of individuals in each nest was small. *Tetramorium cæspitum*, Linn., was also abundant, and *Lasius alienus*, Först., generally distributed. The only occasion on which I have seen bees plentiful this season was one morning at the end of May, in the lanes round Moreton-Hampstead. *Andrena similis*, Sm., ♂, and *A. varians*, Rossi, were abundant and fresh; *A. cingulata*, Fab., and *helvola*, Linn., and a single ♀ of *Halictus lævigatus*, Kirb., also occurred. In a sandy bank there was an enormous nest of *Lasius fuliginosus*, Ltr. Unfortunately, I had no net on this occasion, and, being a very bright day, bees were not easily to be caught in the fingers. As in other localities, *Andrena angustior*, Kirby, is generally distributed all round Dartmouth, and over the moor, but not very abundant. I have taken a few specimens of *A. fulvago*, Chr., in the blossoms of *Hieracium*, and a single ♀ *A. fucata*, Sm., freshly emerged. The ♂ of the latter appears to be unknown in this country, unless it is identical with that of *helvola*, Linn., *fucata* being merely a variety of that species. *Osmia fulviventris*, Pz., *ænea*, Sm , and *aurulenta*, Pz., have all occurred, the two latter on the cliffs. *O. aurulenta* was making use of the empty shells of the whelk, which lay at the foot of the cliffs, for its *nidus*. The cells are lined with masticated portions of green leaves. I have often watched *Osmia fulviventris* chewing up rose leaves for a similar purpose, but that species generally, if not always, chooses out the decayed and yellow ones. *Aurulenta* has long been known as using snail-shells for its nest.—R. C. L. Perkins, Townstal House, Dartmouth: *June 15th*, 1891.

Andrena bucephala at Box Hill.—This being an entirely new locality for this species of spring bee, I perhaps may be pardoned for asking the recording of so interesting a capture. On the 5th of last month, in the company of my friend Mr. Alfred Beaumont, I visited the neighbourhood of Box Hill, in the hopes of capturing a few additional insects for my collection; the weather was anything but propitious for our recreation, being very overcast, with a cold N.E. wind blowing, we were, however, favoured with an occasional burst of sunshine, which, although very brief, while it lasted induced a host of insects to appear; during one of these fitful outbursts of sunshine we came across a magnificent clump of sloe bushes (*Prunus spinosa*), which were completely enveloped in a dense mass of bloom, hovering over and around these bushes were numerous species of *Diptera*, *Ichneumonidæ*, *Andrenidæ*, &c., and, amongst others, *Andrena bucephala*, Steph., several of which were soon captured, Mr. Beaumont taking one male with an abnormally large head; not being familiar with this species I submitted it to my friend Mr. Edward Saunders, who with his usual kindness at once identified it for me, with the remark that it was an extremely interesting capture. Mr. Smith, in his Cat. Brit. Hym., 2nd ed., p. 61, says the species is now rare, and gives as its localities, Bristol and Chobham Common. Mr. Edward Saunders says, "local," and adds Hampstead as another locality. *Andrena albicans*, *Trimmerana*, and *nigroænea* were very abundant, while *Nomada ruficornis* and *alternata*, although not so numerous, were also in company. The rarity of this species of *Andrena* is my excuse for troubling you with this note.—T. R. Billups, 20, Swiss Villas, Coplestone Road, Peckham, S.E.: *June*, 1891.

Nomada lateralis, *Panz.*—Two specimens of this handsome parasitic bee were also taken by myself at the same cluster of bushes, and as Mr. Edward Saunders only gives Norwich, Yorkshire, and Newcastle as its known localities, while Mr. Smith adds Highgate Archway, I think it is nearly safe to assume that this is also a fresh locality for this species, and as it was captured in company with *Andrena bucephala*, which is said to be its host, it gives me much pleasure to be able to record its capture at the same time.—Id.

Gelechia alacella in the New Forest.—It is perhaps worth recording the fact that two specimens of the above scarce *Gelechia* fell to my net last season in the New Forest, one in perfect condition in the middle of July, and another, decidedly the worse for wear, in the last week in August. In Stainton's "Manual," ii, p. 332, the larva is said to feed on "lichen on fruit trees," but as there are no fruit trees within a very long distance of either spot, and as both the moths were *beaten from oak*, it seems clear that the larva, if it be really a lichen-feeder, is quite as much at home on lichen growing on oak, and it is not unlikely that it would occur on other lichen-covered forest trees as well.—Eustace R. Bankes, The Rectory, Corfe Castle: *May* 30*th*, 1891.

P.S.—Since the above note was written, I have referred to Sorhagen's "Die Kleinschmetterlinge der Mark Brandenburg," and his remarks about *G. alacella* may be worth quoting, as bearing on the point. He says, "Grabow discovered the larva near Berlin at the end of June, on the lichens on oak and fruit trees, where possibly it only goes through its transformations. Larva greyish-white, with black head and thoracic plate."—E. R. B.: *June* 15*th*, 1891.

Gelechia lutulentella in the Isle of Purbeck.—On July 15th last year, I had the good fortune to take a nice specimen of *Gelechia lutulentella* in this neighbourhood; it was on the wing at about sunset, in company with *G. lentiginosella* (which it closely resembles in size and shape), in a rough pasture, where *Genista tinctoria* grows freely. This insect is apparently one of those which nearly always occur *singly*, and seem to appreciate the "charms of solitude," in so far as their own species are concerned!—Id.

Note on Nepticula tormentillella, H.-S.—As on the strength of my note in Ent. Mo. Mag., xxiv, 160, I may, perhaps, be considered responsible for the introduction of *Nepticula tormentillella* into the British list, I am anxious to clear up the matter, at any rate in so far as I am connected with it.

Unluckily, not a single moth was bred from the larvæ there recorded as having been found on *Potentilla tormentilla* in Yorkshire and Westmoreland, as they were late stragglers, and were all ichneumoned, but I have no doubt in my own mind that they belonged in reality to the recently-described *N. serella* (Ent. Mo. Mag., xxiv, 260), instead of to *N. tormentillella.*

As regards the specimens in the cabinet of Mr. P. B. Mason, which are mentioned in my original note as having been bred by the late Mr. Sang, I learn from Mr. Mason that he now fully believes them to be referable to *N. serella*, rather than to its continental ally.

It follows, therefore, that the whole of my previous note should be understood as referring to *serella*, which had not been described at the time it was written;

and as I am not aware that the true *tormentillella* has occurred in Britain as yet, the latter species has, to the best of my belief, no claim to a place in our list.

I should have made the correction before this, but was misled by the way in which my note is referred to in the index of Ent. Mo. Mag., xxiv. Happening to notice that, without a word having passed to or from me on the matter, my description of the larva had been entered, under the heading of "Larvæ of British species described in this volume," as belonging to *N. serella* (the original description of which had appeared in a later part of the same volume), I naturally concluded that the rest of my note had been indexed as referring to *serella*, and that my mistake had to all intents and purposes been set right; unfortunately, however, such is not the case, as I see that strangely enough both in the general and the special index my remarks are entered as applying to the true *tormentillella* !—Id.

The flight and pairing of the genus Hepialus.—Referring to my communications on this subject (vol. xxiii, 1st series, pp. 186 and 214), in which I described the flight and pairing of *H. humuli*, *hectus*, and *sylvinus*, I have now to record that I have at last observed the pairing of *H. lupulinus*, and the manner in which the ♀ attracts the ♂. I have no doubt the process is exactly the same as in *sylvinus*, but I was fortunately able on the present occasion to watch her for a considerable period, and as this species flies whilst it is yet light, my observation, though a solitary one, appears quite complete and satisfactory. On the evening of June 3rd, I saw a newly emerged ♀ crawling up a grass stem. It was then just eight o'clock, and at the same moment a ♂ approached with its usual rapid, irregular flight. It flew within a foot of her, but did not take the slightest notice, and was evidently unconscious of her proximity. When she was half way up the stem she commenced to vibrate her wings; first there was a preliminary flutter or two, and then a steady long-continued vibration, which lasted without any intermission for ten minutes. A ♂ then approached. It flew in its usual quick, erratic manner, until within about three feet of where she sat. The rapid flight was instantly checked, and it commenced to fly backwards and forwards, advancing very slowly as it did so, evidently searching for her, when within a foot I netted it, and in doing so slightly disturbed her; the vibrations of her wings ceased, and after a short pause she commenced to crawl further up the stem. I feel sure it was the net that disturbed her, and not any consciousness of the approach of the ♂. As she climbed up, she gave a quick flutter or two, then moved up a little, another flutter and a further progress upward, until she seemed satisfied, settled herself comfortably on the stem, and begun again with the rapid vibrations of her wings. This was kept up as before for rather over twenty minutes before another ♂ appeared. It flew in the same way, rapidly but erratically, until within three or four feet, and then slowly backwards and forwards, advancing as it did so, until he found her. The act of pairing appeared to be completed instantly. There cannot, I think, be the slightest doubt that the ♀ diffuses faint attractive odour (though I confess I was again unable to detect it), and that the vibration of the wings, as in *sylvinus*, assists to diffuse it. This diffusion, judging from the distance at which the males changed their mode of flight, does not appear to be effective more than three or four feet from where it emanates. The night in question was absolutely calm, perhaps with a little wind it might have influence at a greater distance.—John E. Robson, Hartlepool: *June*, 1891.

Lampronia rubiella.—It appears that in my note on the earlier portion of the life-history of this species (Ent. Mo. Mag., June, 1891), I did not make it sufficiently clear that I took for granted that it was well-known that the larva inhabited the buds or shoots of the raspberry in spring, and that my observations filled up the ***hiatus*** between the appearance of the moth in May (this year June) and the half grown larva in the following March, and that it might be supposed that I was giving the whole life-history, this reading being facilitated by my using the word emerge in reference to the escape of the larva from its cocoon of hibernation, so that one might suppose I meant the emergence of the moth. Stainton, in "The Manual," 1859, says, "larva in shoots of raspberry, April—May," and its name would suggest that a knowledge of this portion of its life-history is of considerably older date. There is one point in connection with this period of its existence perhaps worthy of note. In entering the bud in March (or April), it does so just as it begins to open (an odd belated larva may be found occasionally living *Tortrix* fashion in the leaves), eating out the centre, and especially the pith, and finally pupating in the cavity so formed. It does all this so early in the history of the bud, that a secondary bud at once takes the place of the one destroyed, hurries forward, and bears fruit; indeed, is so successful in taking the place of the lost bud, that but for its existence in the axil of the new shoot, the latter would be supposed to be the ordinary normal shoot. It is, therefore, remarkable that neither as a young larva in the fruit core, or when older in the bud, does it do any material injury to the prospects of the crop. My interest in the species centres largely in its method of oviposition. The discovery by Dr. Wood and myself of the oviposition of the large species of *Micropteryx*, being followed by that of a similar habit in *Lampronia*, *Adela*, &c., viz., the long-horns, and a suspicion that the same habit exists in some of the *Glyphipterygidæ*, raises the question as to whether this remarkable habit, and its correlated structure, associated with metallic brilliance in many of the moths, does not necessitate bringing the several insects possessing it together into one family, and at any rate it demands more observers to note the various ways in which it is carried out in the different species. It leaves as a more obscure and interesting problem than ever the life-history of the small *Micropteryges*.—T. A. Chapman, Firbank, Hereford: June, 1891.

Re-occurrence of Col. chalcogrammella.—It is very satisfactory to be able to record the finding of a few cases of the above rare species at Scarborough, the only locality known for it at present in Britain.

It was during 1883 I made my first journey to Scarborough specially for the larva of this insect, and since that time two others, all of which proved fruitless.

It seemed very odd to me that an insect which Mr. Wilkinson, of Scarborough, used to take at times in abundance should have so effectually disappeared since his death, now about fifteen years; I felt convinced it must still be there, and, notwithstanding my former disappointing journeys, I determined to again visit the place this year, and thoroughly search every likely spot for the food-plant; I could gain no information as to in what part of Scarborough it used to be taken, and so, during the last week in May, I thoroughly searched all the dry slopes and broken ground along the coast south of the town, as far as Flamborough Head, where the *Cerastium arvense* was likely to occur, and to the north about two miles beyond Scalby Mill Hotel: at last I found a few patches of the *Cerastium*, and carefully searched it for some considerable time, when I found a few of the leaves had evidently been mined by a *Coleophora* larva, and shortly after was rewarded by finding one of the small, straight, brownish cases of *C. chalcogrammella*, but although I examined every shoot of these patches of *Cerastium* separately, I could only find four more cases, making five in all, so that they are evidently very scarce. I had no further opportunity of searching for more of the food-plant about this part of the district, for the next day turned out very windy and wet, with showers of sleet and snow, so that further search under such conditions was impossible, and the following day my eight days' visit came to a close.—Geo. Elisha, 122, Shepherdess Walk, City Road, London, N.: *June 17th*, 1891.

Anisotoma Triepkii at Woking.—During last summer I caught two males and two females of this rare beetle by evening sweeping on the heathery commons round here. I suspected from their size and the shape of their posterior legs that they belonged to this species, but I did not like to refer them to it for certain; Mr. Champion, however, has had the kindness to examine them carefully with his specimens of *Triepkii*, and tells me that they agree with them exactly. While on the subject of *Anisotoma*, is it known that any of the species habitually hop? I was much surprised the other evening after catching a small beetle flying, which I took to be an *Anisotoma*, to see it give a considerable jump in my net. I then thought I must have made a mistake as to its identity, but on bottling it there was no doubt of its being a true *Anisotoma*, but I am not sure of its species.—Edward Saunders, St. Ann's, Woking: *June 15th*, 1891.

Hydroporus ferrugineus, Steph., in the Hastings district.—I have taken this species in some numbers in two very small pools, less than a yard in circumference, along the cliffs; they seem to prefer the crevices in the rock, where it is no easy matter to get them; on one occasion I found about twenty in a small crevice in the rock about half an inch wide.—A. Ford, Claremont House, Upper Tower Road, St. Leonards-on-Sea: *June*, 1891.

Otiorrhynchus sulcatus devouring ferns.—I have been very much surprised lately to find this weevil destroying the fronds of the ferns in my greenhouse. Noticing two or three specimens of the insect a fortnight ago, I concluded that they had come from the vine which occupies a corner of the house, and the destruction of the fern fronds I attributed to slugs. A nocturnal visit, however, disclosed the fact that the weevils were the offenders, for they were clinging to the fronds, and busily nibbling away at the edges. In some cases little more than the mid-rib was left remaining. The insect seems very partial in its tastes, and chiefly attacks the hart's-tongue (*Scolopendrium vulgare*). A careful examination disclosed the fact that the larvæ had wintered in the pots which contained the ferns, for I found both pupæ and newly emerged beetles buried in the earth.—Theodore Wood, Baldock, Herts: *June 4th*, 1891.

[I can confirm the above observations, although I have not seen a reference made to a like occurrence before; some time ago, however, I received specimens of *O. sulcatus* from a gardener, which he had found destructive to maiden-hair ferns in one of his houses; the larvæ had been found at the roots.—W. W. F.]

A new species of Aleurodes?—Pale golden-yellow; antennæ and legs paler, infuscated beneath; eyes oval, black, almost divided in the middle; tip only of the rostrum black; wings clear milk-white, without any spot.

To-day I found these insects in great abundance on brambles, in one of the old pits on Blackheath. At first I thought I had obtained *A. rubi*, Sign. (Ann. Soc. Ent. France, 4e Ser., viii, p. 382, 1868), but it cannot be that species, which is "yellow, spotted with brown-black, the elytra with one black spot. Head wide, large, almost entirely black; 2nd and 3rd joints of the rostrum black, the 3rd black above, yellow beneath. Antennæ brownish. Eyes reddish-brown, much divided. Thorax and breast more or less black. Legs, except at the joints, black. Abdomen yellow, the last segment black beneath," &c. It is far more in agreement with *A. carpini*, Koch; that species, however, has hitherto been believed to be special to the hornbeam. The present, form, I believe, is distinct; I name it provisionally *A. rubicola*. The larva, in autumn, should afford good characters.—J. W. DOUGLAS, 153, Lewisham Road, S.E.: *June* 15*th*, 1891.

The New Forest: projected spoliation.—In "The Times" of to-day, June 12th, is advertised for letting on building lease by H. M. Commissioner of Woods, the freehold enclosure, Coxleaze Plantation, containing 33 acres, and also the freehold enclosure, Ironshill Park, containing 44 acres, both near Lyndhurst. Can nothing be done to prevent this continued diminution of the forest land? The Entomological Society formerly did yeoman's service in preventing encroachment on a larger scale; can they do nothing now?—C. A. BRIGGS, 55, Lincoln's Inn Fields: *June* 12*th*, 1891.

Review.

THE BUTTERFLIES OF NORTH AMERICA; 3rd series, part xi: by W. H. EDWARDS, Boston: Houghton, Mifflin, & Co.; London: Kegan Paul, Trench, Trübner, & Co. 1891.

This Part refers to only three species, but of each of these the life-history is worked out and figured in an exhaustive manner. The first is *Apatura Flora*, Edw., from the Southern States, the plate for which contains nearly thirty figures. This is followed by *Satyrus Meadii*, Edw., from Colorado and the neighbouring mountainous States, with about twenty figures. Lastly, *Chionobas Chryxus*, Dbdy. and Westw., and its var. *Calais*, Scud., from the Rocky Mountains and British N. America, from Newfoundland to the Pacific, with nearly thirty-five figures. Each species is traced *ab ovo*, and the *Chionobas* is especially interesting, owing to the habits of the species of the genus, and their difficulty to rear from the egg. Altogether this is a capital Part from a biological point of view.

Obituary.

Robert Gillo, of Bath, who has recently died, was well known as a Coleopterist in the west of England, and was very successful as a collector; on a specimen which he captured near Bath, a new *Amara* (*nitida*, Sturm) was introduced into our lists; he used also to take several good insects in considerable numbers, among them, *Copris lunaris* and *Onthophagus ovatus*, and he was always very liberal in distributing them to his friends; it is to be hoped that some other Coleopterist in the district will be found to carry on his work, as the locality seems to have been but little worked, and to be capable of producing many good insects.

Societies.

BIRMINGHAM ENTOMOLOGICAL SOCIETY: *June 1st*, 1891.—Mr. R. C. BRADLEY in the Chair.

Mr. G. W. Wynn showed eggs of *Endromis versicolor*, found on birch twigs at Wyre Forest; two small batches had been found placed round the stem near to the ends of the twigs. He also showed *Tœniocampa populeti* from Marston Green, &c. Mr. A. Johnson showed larvæ of *Hibernia aurantiaria*, from specimens taken at Sutton. Mr. R. C. Bradley showed a box of *Pyralidæ* from his collection.—COLBRAN J. WAINWRIGHT, *Hon. Sec.*

ENTOMOLOGICAL SOCIETY OF LONDON: *June 3rd*, 1891. — FREDERICK DU CANE GODMAN, Esq., M.A., F.R.S., President, in the Chair.

Mr. J. M. Ayde, of Somerford Grange, Christchurch, Hants, and the Rev. John Seymour St. John, B.A., of 42, Castlewood Road, Stamford Hill, N., were elected Fellows.

Mr. E. B. Poulton exhibited living larvæ of *Endromis versicolor*, and commented on their habits.

Mr. W. F. H. Blandford called attention to the fact that the larvæ of *Liparis monacha* remained in small groups on the bark of the tree for about a week after emerging from the eggs, and that this fact was taken advantage of by the German foresters to destroy them. Also that he had himself verified the statement that uric acid can be detected in the malpighian tubes of insects. Mr. McLachlan agreed that the demonstration that the malpighian tubes were of the nature of renal organs was now satisfactory.

Mr. C. J. Gahan exhibited two species of *Coleoptera* that he considered to possess a mimetic resemblance, viz., *Estigmena chinensis*, one of the *Hispidæ*, and a nondescript Lamiid allied to *Pemptolasius*. He called attention to a peculiar structure of the antennæ in the latter by which the resemblance was increased.

Mr. Tutt exhibited a hybrid between *Amphidasis prodromaria* and *A. betularia*, obtained by Dr. Chapman. Mr. Stainton commented on the fact that the two insects appeared at different times; and Mr. Tutt stated that the *A. betularia* had been subjected to forcing, so as to cause it to emerge at the same time as *A. prodromaria*.

Mr. Tutt also exhibited forms of *Caradrina*, some of which he said were considered distinct on the continent, though they were not recognised as such in this country, viz., *Caradrina taraxaci (blanda)*, *C. superstes*, Tr., from Sligo, and *C. superstes*, H.-S., considered as synonymous with *superstes*, Tr., but apparently more closely allied to *C. ambigua*.

Mr. Bristowe exhibited varieties of *Arctia menthastri*, some of which had been fed on mulberry and others on walnut; no difference was observed in the variation.

Mr. G. Elisha exhibited larvæ in their cases of *Coleophora vibicigerella* and *C. maritimella*.

Mr. A. G. Butler communicated a paper, entitled, "Additional notes on the synonymy of the genera of Noctuid Moths."—DAVID SHARP, V.P., *Acting Secretary*.

NOTES ON THE BRITISH SPECIES OF THE GENUS *HETEROCERUS*, FAB.

BY REV. CANON FOWLER, M.A., F.L.S.

Since the publication of Vol. III of my work on the British *Coleoptera*, two important papers have been published on this much neglected and very obscure genus:—"The species of *Heterocerus* of Boreal America," by Dr. Horn (Trans. Amer. Ent. Soc., xvii, January, 1890), and the "Bestimmungstabelle der *Heterocerus* Europas und der angrenzenden Gebiete," by Herr A. Kuwert (Verhandlungen der kaiserlich-königlichen zoologisch-botanischen Gesellschaft in Wien, p. 517, 1890); a description of a new species described by Herr Kuwert in his paper, *H. britannicus*, together with notes on other species, will be found on page 132 of this volume. Since writing these I have had further correspondence with Herr Kuwert, who, in his last letter, expresses regret that he had not more specimens from Great Britain when he wrote his paper; it is very probable that we have more species than those below enumerated, but several of them are extremely hard to distinguish, and even with named specimens from Herr Kuwert before me, I find it very hard to separate closely allied species, and am by no means sure that they will all prove eventually to be distinct.

The table given in Vol. iii, p. 384, of my work will serve roughly to distinguish the majority of the species which were known as British when I wrote it, but the character of the presence or absence of margins on the posterior angles of the thorax is often a very obscure one, and apt to prove exceedingly misleading (occasionally, as in the continental species, *H. obliteratus*, Kies., they are present in one sex only); on this character, however, Kuwert forms two of his principal subgenera, *Heterocerus*, i. sp., in which the hind angles of the thorax are not margined, and *Tænhetocerus*, Kuw., in which they are margined, or at least show a trace of margins. The other subgenera, *Micilus*, Schiödte (containing a single species, *M. murinus*, Kies.), and *Phyrites*, Schiödte (containing a single species, *P. aureolus*, Schiödte), are not represented in Britain; the former is distinguished by the shape of the scutellum (which is punctiform and subtransverse), and the latter by having the third joint of the antennæ small, and the fourth forming with the following a uniform club; whereas, in *Heterocerus* and *Tænhetocerus*, the third and fourth joints are both small. Kuwert also makes too much use of colour distinctions; this, perhaps, is to a certain extent inevitable, but the colour in this genus is extremely variable, and often misleading as a character; in fact, he practically admits this, for, after defining one division as follows:—

"Elytra always without smaller light double spots set colon-wise on their disc," he proceeds to say of the corresponding division—"Elytra with double colon-like spots on their disc, which are usually oblong and often coalesce; the first dots sometimes join the shoulder spots, and cause the markings to resemble those of group 5" (of the preceding division). It is obvious, therefore, that the distinction is not of much practical divisional value, although it appears to be of service in helping to distinguish certain species; in others it appears to be valueless.

While, however, we must allow that the markings of the upper surface are of but little value as definite characters, yet they must not be ignored altogether; and Dr. Horn points out in connection with them that there is one point of considerable utility. "In a number of species," he says, "there exists a pale spot at the middle of the base of each elytron more or less prolonged backward. This is very constant in the species to which it is known to belong, and has as much value here as a similar white spot at the middle of the base of the elytra in certain groups of *Cicindela*. In fact, the fully developed markings of *Heterocerus* are decidedly Cicindeloid in type."

Kiesenwetter appears to have been the first who attempted to monograph the species; this he did without reference, for the most part, to structural characters, and, as he based the descriptions chiefly on colour and sculpture, and this in the case of small series, it is not to be wondered at if his characters are misleading. Schiödte, in 1866, attempted a division on the antennal characters, one of the divisions, *Augyles*, having only ten joints to the antennæ; this is, however, a very difficult and uncertain point to determine, but must be noticed in connection with the fact that the name *Augyles* was wrongly applied afterwards to the division or subgenus now known by the name of *Littorimus* Des Gozis.

In 1872 Mulsant and Rey observed that in certain species the elevated curved line on the first ventral segment extended from the front angle by a broad curve towards the middle of the posterior edge of the segment, and there terminated, while in others the line continued the curve forward towards the inner edge of the coxa. In the former case the abdominal plates are called open (plaques abdominales ouvertes), and in the latter entire (plaques abdominales entières); for the species with entire plates the name *Augyles* was erroneously adopted, but was changed by Des Gozis to *Littorimus*; it is, however, incorrect to speak of "abdominal plates" in this connection; the only point to be noticed is the ridges, which are really organs of stridulation, and form a much more important character than the margination of the thorax on which Kuwert and other authors base their chief divisions.

Dr. Horn gives the characters depending upon these ridges as follows :—

Stridulating ridge of first ventral segment incomplete, *i. e.*, extending from the front angle in a curved line merely to the posterior border of the segment... *Heterocerus.*

Stridulating ridge of first ventral segment complete, *i. e.*, forming nearly a semicircle from the front angle to the posterior border, then recurving to the inner coxal border ....*Littorimus.*

As far, however, as our fauna is concerned, this character is not of much use, as the subgenus *Littorimus* only contains two species, *H. britannicus* and *H. sericans*, and it is doubtful whether the latter species can really be regarded as British ; it seems, therefore, that we must, to a certain extent, fall back upon the character presented by the margination of the posterior angles of the thorax, in spite of its being so unsatisfactory. *H. flexuosus, femoralis, salinus* v. *rectus*, and *arenarius*, will be found to present scarcely a trace of margins, whereas in the other species they are more or less distinctly visible.

Dr. Sharp (Biol. Cent. Amer., vol. i, pt. 2, p. 116) makes use of a character which he has recently observed, and which may prove to be of considerable importance. In several of the American species there is an elevated line on the metasternum, which begins at the middle of the posterior border of the middle coxa, extending obliquely backward and joining the suture between the metasternum and its episternum ; it is possible that this may prove a good character with regard to some of our species, but I have not been able to observe it in those that I have examined. The shape of the labrum and mandibles in the male will also be found to present marks of distinction ; the sculpture of the elytra will be seen to vary much in the same species, some specimens being more plainly substriate and more coarsely punctured than the others. When we take into account the great difference that also exists in the markings of the same species, it will at once be seen how very easily confusion may arise : the clothing consists of a more or less dense, short, semi-erect pubescence, the margins being set with longer hairs, which are more conspicuous on the thorax.

The males are, as Dr. Horn observes, in most cases easy to distinguish from the females ; the head is larger and more prominent, the mandibles more slender and projecting, the labrum longer, and the clypeus retuse to a varying degree ; the thorax is at least as broad as the elytra, sometimes slightly broader, and not gradually narrowed to the front as in the female; at the same time it must be remembered that it is easy to regard the male as a separate species, an error which can only be avoided by capturing the species in their burrows, two, a male and a female, usually occupying one burrow. The species, as is well known, live in these burrows or galleries, which they excavate in soft mud near pools or small lakes, or on the margins of muddy streams; they are very conspicuous, and the presence of the beetles may easily be detected by their means; when disturbed they run from their galleries and quickly take to flight, especially in hot weather.

Our British species have usually been considered to be eight in number: of these *H. fossor*, Kies. (*rectus*, Wat.), and *H. arenarius*, Kies., have been regarded as doubtful, and the generally recognised species, six in number, are *H. femoralis*, Kies., *H. obsoletus*, Curt., *H. marginatus*, F., *H. lævigatus*, Panz., *H. fusculus*, Kies., and *H. sericans*, Panz. As far as I have been able to make out, *H. rectus*, Wat., is an intermediate variety or species between *H. salinus* and *H. fossor*. *H. arenarius* must still be regarded as very doubtful. *H. femoralis* and *H. flexuosus*, which have usually been regarded as synonymous, must now be considered as distinct. A new species, *H. pulchellus*, Kies., must be added doubtfully before *H. fusculus*; and for *H. sericans*, a newly described species, *H. britannicus*, Kuw., must be substituted. Apparently we do not possess the true *H. sericans*, but the specimens which have been named for me by Herr Kuwert as *H. britannicus* appear to differ considerably, and I was at first inclined to think that part of them should be referred to an allied species, if not to *H. sericans*, which may perhaps be found in our collections.

The following, then, will be the list of our species as at present known:—

Subgenus HETEROCERUS, *i. sp.*
flexuosus, Steph. (*femoralis*, Kies., *pars.*).
salinus, Kies., var. *rectus*, Wat.
(*arenarius*, Kies., ? ?).
femoralis, Kies.

Subgenus TÆNHETEROCERUS, Kuwert.
marginatus, F.
(*sericans*, Kies , ? ?) }
britannicus, Kuw. } s. g. *Littorimus*, Des Gozis.
obsoletus, Curt.
pulchellus, Kies. ?.
fusculus, Kies.
lævigatus, Panz.

H. flexuosus, Steph., and *H. femoralis*, Kies., are considered synonymous in our catalogues; the latter insect is, however, smaller, with the elytra rather shorter and the hinder indented cross-markings situated a little nearer the middle; the markings, according to Kuwert, are reddish in *H. flexuosus* and yellow in *H. femoralis.* I have only seen one specimen of the true *H. femoralis*, which was sent me by Mr. Waterhouse (without locality) and named by Herr Kuwert; it certainly looks very different from *H. flexuosus*, being shorter, smaller and duller, with the general colour dark and the markings hardly visible. *H. flexuosus* is, apparently, a rather common species with us, but Herr Kuwert says that he only possesses one example of it from Morlaix. *H. femoralis* would seem to be rare in Britain, but there still appears to be considerable confusion with regard to it, and considerable doubt as to what really is the *true H. femoralis* of Kiesenwetter; Herr Kuwert sent me a specimen named *H. femoralis* from Pomerania a short while ago, and now writes concerning it, that he is inclined to believe "that the *femoralis* from Pomerania, which has the legs paler and is larger, may perhaps be the *arenarius* of Kiesenwetter." With regard to *H. arenarius* I cannot discover an authentic British specimen; I believe that light examples of *flexuosus* and *lævigatus* are made to do duty for it. The following is Kuwert's account of the species:—"A little larger than *femoralis.* According to Kiesenwetter (I have no examples to refer to) in colour, markings and pubescence it comes half way between *salinus* and *femoralis*, but the colouring is brighter and the legs are entirely yellow." The only locality he gives is Ireland; as, however, I have pointed out (*l. c.*, vol. iii, p. 386) Mr. Crotch came to the conclusion that the Irish specimens did not differ materially from *H. femoralis*; I believe, therefore, that *H. arenarius* should be regarded merely as a synonym of the last named species.

Among the insects which I sent to Herr Kuwert were specimens named *H. rectus*, Wat., from Mr. Waterhouse's and Mr. Champion's collections. These he is inclined to regard as a new variety or species, and proposes that they should be described as *intermedius*, *n. sp.*, as being intermediate between *H. salinus* and *H. fossor*; *H. rectus* has usually been regarded as synonymous with *H. fossor*, but will now stand as a variety of *H. salinus.* Herr Kuwert was not aware that it had been described, but, apart from this, there is a species of Kiesenwetter's already in existence named *intermedius*, which comes near *hispidulus*, Kies.

H. salinus is a rather large species (6—7 mm.), parallel, with bright yellow markings, and legs entirely yellow; the elytra are twice as long as together broad; the thorax is short, with the sides strongly rounded and the margins more or less strongly yellow; the club of the antennæ is somewhat long; the colouring is variable and the pubescence thick. The variety *rectus* differs in being smaller, with the antennæ darker, and the legs dark instead of light; it also has, in the male, two small, but distinct, prominences on the head behind the clypeus, which are scarcely visible in the type form. *H. fossor* has lighter legs than the var. *rectus*, and only one small prominence on the head behind the clypeus.

H. marginatus and *H. lævigatus* are often confused. The latter is rather the larger species, and is duller and more plainly pubescent, with the markings longer and more colon-like (colonartigen) on the disc of elytra; in *marginatus* they are smaller and more often form spots; the scutellary region appears to be usually dark in *marginatus*, whereas in *lævigatus* it is often occupied by more or less long yellow markings; in the latter species the second joint of the antennæ ends in a whitish tuft of hairs, of which the longest reach the apex of the club. Both these species have the hinder angles of the thorax rather distinctly margined.

Of *H. britannicus*, Kuwert, I have already given the description in Ent. Mo. Mag., present volume, p. 133, and need not here repeat it. I have received specimens (named *H. sericans*) from Mr. Bennett, of Hastings, which are considerably darker than the Scotch examples, taken in numbers by Mr. Lennon near Dumfries; it is possible that *H. sericans* is not British; it is a larger insect than *H. britannicus*, with the markings yellow instead of red. I have not seen a British specimen agreeing with the description.

H. obsoletus, Curt., is one of our most distinct species, by reason of its rather large size (5 mm.), broad form, coarse punctuation, and small but plain markings.

H. fusculus, Kies., is an extremely local species, but occurs abundantly at Luccombe Chine, Isle of Wight. I sent a specimen to Herr Kuwert, taken by myself at this locality, and he named it *pulchellus*, Kies.; a specimen, however, taken by Mr. Champion at Sandown, is returned as *fusculus*, and I believe that both insects belong to one species; another specimen of Mr. Champion's, from Dr. Power's collection, without locality, is returned as *pulchellus*; and another (rather larger) from the London district as *fusculus*. The former is described as smaller than *H. fusculus*, and always with plainer and brighter markings, but the differences seem very slight, and I cannot decide, without further material, whether we have both species in Britain. The characters drawn from the colour of the sides of thorax and of the legs are plainly untrustworthy in these closely allied species; if the species are really distinct, I am inclined to think that all the Isle of Wight specimens must be referred to *pulchellus*, and the single specimen above referred to as belonging to Mr. Champion, from the London district, to *fusculus*, and that Herr Kuwert is wrong with regard to the Sandown specimens.

The above notes are more or less fragmentary, but may serve as a help to any one who has time to collect material and really work the genus. I do not know of any other small genus among our *Coleoptera* which presents so much difficulty, except perhaps *Haltica*, on which we may hope some additional light may be thrown by the researches of Mr. Edwards, of Norwich, who is now working at it.

Lincoln: *June*, 1891.

PLUSIA BIMACULATA, STEPHENS.

BY H. T. STAINTON, F.R.S.

The Stephensian specimen of this insect is now in the British Museum.

When the Stephensian Library was removed here in 1853, along with the books came one solitary book-box, containing a number of

Continental specimens of reputed British insects—such as *Aglia Tau*, *Gluphisia crenata*, &c. I had never looked on the box as containing anything of value till I read Mr. Mason's note on *Plusia bimaculata* at p. 163 of this volume. I then referred to this box, and there, sure enough, was the missing specimen, along with several other *apparently* British specimens of curious *Plusiæ*.

I lost no time in communicating my discovery to Dr. Günther, F.R.S., and hearing from him that the Museum would be glad to receive this box of insects, I took it there and handed it to him on the 22nd June. It had been an inmate of this house for 38 years!

Mountsfield, Lewisham, S.E.:
July 4th, 1891.

ON TWO UNDESCRIBED SPECIES OF THE GENUS *PHANÆUS*, MACLEAY.

BY B. G. NEVINSON, M.A., F.Z.S.

PHAN. BOUCARDI.

Niger subnitidus. Clypeus emarginatus et valde bidentatus angulis utrinque obtusis. Thorax omnino grosse punctatus, antice æneus angulis obtusis, ad basin bi-impressus. Elytra striata interstitiis subconvexis minute punctatis. Corpus subtus rufo-hirtum metasterno punctato medio canaliculato, pygidio æneo crebre punctato. Tibiæ anticæ quadridentatæ in utroque sexu sine tarsis.

Mas major. Caput cornu erecto, transverse trituberculato, tuberculo medio vix majore. Thorax abrupte in medio declivis utrinque profunde foveolatus, processu superiore obtuse quadridenticulato, denticulis lateralibus majoribus sed vix divergentibus.

Femina. Frons transversim carinata et trituberculata. Thorax omnino grosse punctatus, antice declivis, apice medio transversim et arcuatim carinato, pone carinam leviter depressus. Long., 22 mm.

Hab.: Nicaragua (*Boucard*).

This interesting species comes close to *Ph. Pluto*, Har. The clypeal teeth are very long and slender, and the head horn sharply tridentate, the teeth being more approximate than in *Pluto*. The median process of the thorax is obtusely quadridentate, the exterior teeth being barely produced, instead of, as in *Pluto*, being strongly divergent. The whole of the thoracic surface, including even the shining declivous portion, and the deep depression on either side of it, is strongly punctured. The striæ of the elytra are broad and opaque, the interstices narrow and shining on their summits, and minutely punctate. Pygidium greenish, closely punctate. Metasternum shining, punctate, with a slender, well-defined central sulcus. Pubescence reddish and abundant.

PHAN. CUPRICOLLIS.

Corpus atro-cæruleum vel subæneum, thorace cupreo, elytris nigris, opacis, subsericeis, subtiliter striatis, interstitiis planis. Pygidium atro-viride. Tibiæ anticæ tridentatæ. *Long.*, 19 *mm.*

Hab.: Nicaragua, Chontales (*Belt*, *Boucard*, *Janson*, &c.), Panama, Chiriqui.

Mas. Caput cupreum, antice nigro-marginatum, cornu nigro erecto subrecurvo antice punctulato, postice ad apicem serratulo. Thorax granulatus, antice declivis, angulis productis, disco medio lævi subquadrato leviter concavo marginibus carinatis, carinis antice denticulo acuto—postice tuberculo conico—terminatis; inter tuberculos orbiculatim excavatus et ad basin bifoveolatus.

Mas minor. Capitis cornu breve. Thorax scabrosus, disco medio contracto, lævi, carinulis marginato, denticulis anticis, tuberculisque posticis obtusis, ad basin bifoveolatus.

Mas effeminatus. Capitis vertex tuberculo acuto instructus. Thorax scabrosus ad basin bifoveolatus, supra marginem anticum disco lævi et quinque tuberculato.

Femina. Caput nigrum postice plerumque cupreum, fronte transverse carinata et obsolete trituberculata. Thorax cupreo-refulgens, scabrosus, ad basin bifoveolatus et interdum nigro-maçulatus, antice carina media arcuata et trituberculata, tuberculis nigris. Tibiæ anticæ tarso minuto instructæ.

Closely allied to *chryseicollis*, Har., with which in collections it is usually confounded. It is easily distinguished by its distinctly margined thoracic disc, and by its basal tubercles being closer together and not incurved at their apices, also by the more granular sloping sides of the thorax. Moreover, it is a more southern species, apparently not occurring further to the north than Chontales, in Nicaragua, whereas *chryseicollis* is restricted to Mexico.

Two other allied forms, *noctis*, Bates, and *auricollis*, Harold, are easily separated from it: the first by the smooth sloping sides of the thorax, and smooth pygidium, the second by the very coarsely punctate posterior surface of the thoracic basal tubercles, and its brilliant green or coppery pygidium.

In the Biologia Centr. Amer. Col., vol. ii, pt. 2, tab. 4, figs. 2, 2a, a Chontales specimen of *cupricollis* has by accident been figured as *chryseicollis*, Harold.

6, Tite Street, Chelsea, S.W.:
June, 1891.

ON A NEW BEETLE FROM JAPAN.

BY G. LEWIS, F.L.S.

Sisynophorus, Waterh., Ent. Mo. Mag., xiii, 1876, p. 125 (*Telephoridæ*).

SISYNOPHORUS DICHROUS, *n. sp.*

Flavus, nitidus, pubescens; capite thoraceque sublævibus; elytris nigris distincte punctatis; abdomine infuscato. *Long.*, $5\frac{1}{2}$ *mm.*

Yellow, shining, with elytra and eyes black; metasternum and abdomen, except the terminal segment, dusky. Head and thorax nearly smooth, with yellow pubescence; elytra distinctly but not very closely punctured, with black pubescence; the antennæ and legs are pale yellow, and the claws have a sharp and conspicuous inner tooth.

The species of this genus when alarmed "simulate death" by drawing the head and thorax completely under the elytra, and while lying thus in the net or umbrella look like simple discs. The structure of the skeleton enables them to do this, as there is only a membranous surface behind the thoracic coxæ, and this structure, I consider, brings the genus into the *Telephoridæ*. The *Cleridæ* have a cylindrical thorax with no opening behind the anterior coxæ, and they cannot, therefore, "feign death" as the *Telephoridæ* do.

I took two examples at Kashiwagi, in Yamato, in the middle of June. In Ceylon I found three species, which are, I believe, undescribed at present.

Folkestone: *June 7th*, 1891.

ON A NEW SPECIES OF *EUGASTER (HETRODIDÆ)* FROM SOMALI LAND, WITH REMARKS ON *E. SPINULOSUS*, LINN.

BY W. F. KIRBY, F.L.S.,

Assistant in Zoological Department, British Museum (Natural History), S. Kensington.

Among the many curious *Orthoptera* which inhabit the African deserts, the large spiny apterous insects now placed in the restricted family *Hetrodidæ* are not the least remarkable. The species are not numerous, but are generally rare in collections, which has frequently led to the names given to those known to the older writers being applied to several distinct insects. Thus, *Eugaster spinulosus*, Linn., from Morocco, which is allied to the new species described below, and is excellently figured in Edwards' "Gleanings of Natural History," vol. ii, pl. 285, has sometimes been confounded with the much commoner *E. Guyoni*, Luc., from Algeria; but *E. spinulosus* is a black and testaceous insect, with black spines on the thorax, and a black abdomen with transverse rows of (mostly square) pale spots, while *E. Guyoni* is uniformly black, except that the spines, and the spiny raised hind-border of the pronotum, are red. The specimen of *E. spinulosus* in the British Museum was brought by Mr. J. J. Walker from Fez. He states that the insect is much sought after by the natives as an aphrodisiac, and that they are extremely unwilling to part with specimens.

EUGASTER WOODII, *sp. n.*

Male. Head black, and rugose-punctate above the eyes; white below, clypeus with scattered punctures, and transversely striated at its lower extremity; antennæ brown above, bluish-white at the base; between them stands a strong, short, conical horn. Pronotum brown, uneven, strongly punctured, mottled with black, and the spines blackish towards the base; with red tips. On the front edge are four spines at about equal distances apart, the two middle ones small, the lateral ones larger, and each with a still larger one, nearly erect, a little behind and within it. At the base of each of these hinder spines is a round pale depression, and another obliquely behind it, more or less surrounded with black. Behind this point the pronotum is slightly constricted, and a central lobe commences with a large spine on each side, which is nearly horizontal, and blackish at the base; between these spines are four black marks, the front ones forming long triangles directed backwards, and the hind ones transverse curves. Behind each spine are two black streaks, connected with a series of ten short black stripes, on the hinder edge of the centre of the pronotum; these are flanked on each side by another long red spine at a lower level; these form the first of a series of two long and about five small red spines on each side, which run round the raised hinder lobe of the pronotum, which is not marked with black, except towards the base of some of the spines. Abdomen with the segments light brown in front, mostly striped with pale green beyond the middle, and edged with black behind. Legs white, a white red-tipped spine above the front coxæ, front tibiæ with five or six short spines on each side, middle tibiæ with three or four, hind tibiæ with two to five.

Female similar, but the pronotum paler testaceous, and the abdomen darker brown; the legs are spotted with rusty-brown, which is hardly apparent in the male, and the tibial spines are larger; there are seven or eight on the hind tibiæ.

Long. corp., 32—44 mm.

Hab.: Somali Land.

In the collection of the British Museum. Presented by Capt. C. E. W. Wood, 2nd North Staffordshire Regiment.

Intermediate between *E. spinulosus*, Linn., from Morocco, and *E. Servillei*, Reiche, from Abyssinia. It is abundantly distinct from the former; the latter is not before me, but appears from the description and figure to be much paler, and more uniform in colour.

British Museum (Natural History):
May 18*th*, 1891.

ON OVIPOSITION, AND THE OVIPOSITOR, IN CERTAIN *LEPIDOPTERA*

BY JOHN H. WOOD, M.B.

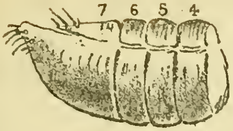
(*continued from page* 185).

We now come to that most interesting class, the plant-cutters. In addition to *Micropteryx* and *Incurvaria*, the genera *Lampronia*, *Adela*, and *Nemophora* must also be included, as well as, judging from dry specimens, *Nemotois*, *Pancalia*, and *Tinagma*, which, perhaps, exhausts the list, so far as the British fauna is concerned. In those that pierce the seed-pods of their food-plants and lay their eggs among the seeds, like *Adela rufimitrella* and *fibulella*, the end of the instrument is conical, but hollowed out on the under-side, and may be likened to the mandible of a bird's beak. In *A. viridella* it is shorter, and more trowel-shaped, and has the visceral tube ending immediately behind it in a pair of large, singular looking flaps. The use and meaning of the apparatus must have remained unsolved but for a valuable observation made by Dr. Chapman. Having placed two moths on some fresh sprays of oak, he found that five eggs had been inserted by their narrow end into the tender petiole of a baby acorn, and were sticking half in and half out of it. We may, therefore, suppose that the trowel gouges in some tender stalk or stem (perhaps, not necessarily, a flower stalk) a shallow cavity, into which the point of the egg is guided by the flaps of the visceral tube. *Nemophora Schwarziella* has a very similar instrument, and she probably sticks her egg half in and half out of some similar part of her food-plant, whatever that may be. *Lampronia prælatella* and *rubiella*, on the other hand, have broad, chisel-like instruments, with the cutting edge curiously indented and scolloped according to the species, and without any flaps to the visceral tube. They are for cutting through the receptacles of flowers and depositing the egg in the loose cellular tissue within. Here, again, I am indebted to Dr. Chapman. I had suggested that *rubiella* would probably lay in the flowers of raspberry, and my friend has actually watched her perform the act. She sits on the open flower, thrusts the point of her body in among the outside stamens, and in about two and half minutes manages to pierce the receptacle and lay her egg. *Prælatella* will almost certainly be found to lay in a similar way in some other flower.

As these various instruments are all very much alike, it makes very little difference which we select for illustration. Let us take, then, *Adela viridella*.

In the first place it is well to notice the great strength of the abdominal

FIG. 5.



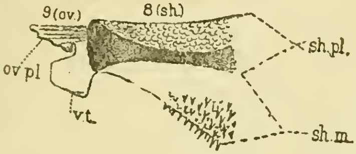


FIG. 6.

case, due to the size and thickness of the plates in all the segments, except the first, which, on the contrary, is weak and almost entirely membranous, in order to enable the insect more readily to curve her body round into the position assumed in laying. The 7th segment (see Fig. 5) is remarkable in several ways. In the first place its lower plate projects considerably beyond the upper, forming by itself the tip of the abdomen—a most unusual feature, and only to be found in these insects. It is also of great size, the dorsal plate equalling in length the 6th and 5th segments together, and the ventral almost the 6th, 5th, and 4th; the latter is besides very deep and capacious, and turns up behind in a rather sharp curve, which ends in an overhanging lip. A fringe of very long tactile hairs comes from under the lip, and others are scattered over the tip of the dorsal plate, none being found in either of the usual situations—the sheath and the ovipositor.

The egg-laying organs are of surprising size, and the rods reach, when retracted, to the junction of the 3rd and 4th segments. On removing the external case, the object that appears most conspicuously is a large chitinous plate that was lying close under the upper wall of the abdomen. This is the sheath—an imperfect structure in one sense, as it consists only of the dorsal plate, the ventral being obsolete. It is of great length, being only one-third less than its rods; and may, for convenience of description, as well as to mark a distinct difference, be divided into two unequal parts, of which the inner is about twice as long as the outer. The inner portion (8 (sh.^{1})) is merely a slightly arched plate, having the outer rods inserted into its corners. Its chief function seems to be to support the inner rods, or rather the plates into which they expand, and prevent their bowing out under the great muscular strain to which they are exposed; whilst a more subsidiary use may be to strengthen, when the instrument is protruded, the weak spot in the outer wall occasioned by the shortness of the 7th dorsal plate. In the case of the outer and shorter portion (8 (sh.^{2})) it is to be noticed that it is compressed laterally, or pinched in, as it were, so that, whilst it becomes much narrower across the back, it is correspondingly deepened at the sides, the cross

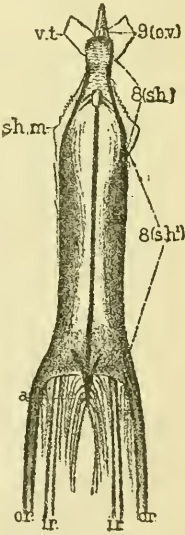


FIG. 7.

FIG. 5.—The end of the abdomen in *A. viridella*.

FIG. 6.—Side view of the point of the ovipositor, and of the outer portion of the sheath. ov. pl., Trowel-shaped termination of ovipositor. v. t., Flaps of the visceral tube. sh. pl., Plate portion of the sheath. sh. m., Membranous portion of sheath.

FIG. 7.—Dorsal view of the sheath and point of the ovipositor; the four rods broken off short. 8 (sh. ^{1}), Inner portion of sheath. 8 (sh. ^{2}), Outer portion of sheath. Other letters as in Fig. 6.

section being nearly semicircular. At the mouth the sides are still more developed, and are even turned in somewhat and approach each other. The ventral plate, as has just been said, is absent, but in its place is a tough, ventricose membrane (sh. m.), which, by bridging over the gap on the under-side of the short, outer portion, completes the periphery of this part of the plate, and gives it all the characters of a sheath ; it is then reflected on to the wall of the abdomen, no trace of it being found covering in the under-side of the long, inner portion. Under these circumstances the outer portion of the plate must be considered in reality as the true sheath, the inner portion being merely a prolongation from it in order to subserve the purposes already pointed out. Scattered over the inner half of the membrane are numbers of small chitinous projections—they may almost be called teeth,—which must come in usefully in steadying the parts upon the plant-structure in the process of laying.

As we saw in *Col. cæspititiella* that the sheath was not of the same texture throughout, but that some parts were amber-coloured or brown, and others hyaline, these colours representing stronger and weaker structures respectively, so here we find the same saving of material where strength is not needed, and its concentration in the lines of strain and pressure. Except for a narrow faintly coloured portion occupying the whole width at the inner end, the brown part may be said to begin as a pair of narrow bands, one on each side, not much wider than the rods, and continuous with them, leaving a broad hyaline space in the centre of the plate : gradually widening, they nearly meet a little beyond the middle, this spot corresponding as near as may be with that part of the ovipositor where the tendency to yield would be greatest. From this point they begin to contract, and, still keeping to the margin, become reduced in the " true " sheath to narrow but, judging by their dark colour, thick belts, and finally dilate again, and meet round the outer end or mouth, having the appearance of being still further strengthened at this point by very fine transverse ribbing. Thus, to meet the longitudinal strain a continuous band in direct communication with the rod travels the whole length of the organ, whilst at points in its course, particularly at the mouth and near the middle, special transverse strength is also given. Running down the centre of the plate is a brown ridge, something like the one in *cæspititiella,* which terminates some little distance short of the mouth in a small swelling that gives off a spur or tie-rod on each side, and at the inner end in a singular black arrow-shaped process that projects beyond the plate. From the sides of the " arrow " a part of the massive protrudor muscles of the ovipositor take their rise, the other part coming from the plate itself close to the attachment of the rods. It would doubtless endanger the integrity of a body so long and slender as the plate, were the strain from these great muscles to be concentrated entirely at one end, and the ridge has consequently been devised for carrying some of it away, and distributing it further down the organ. I have already referred to the ribbing round the outer end of the plate, but the structure of the pale central portion in the " true " sheath is even more peculiar, and is at the same time very elegant, for it looks as if it were made up of minute scales, like those of a snake's skin. What its meaning is, and why it should be absent from the corresponding part of the inner portion of the plate, which, like the usual run of chitinous material, shows no structural details whatever, I cannot explain.

The ovipositor when at rest is completely concealed within the sheath. Its skeletal portion is represented, as in the case of the sheath, by the dorsal plate only. It consists of two very long and narrow subplates, the separate halves, as I take it, of the dorsal plate, but united at their extreme tip to form the solid penetrating point of the instrument. The subplates have a thick inside vein, or rather a double vein with a narrow intervening bit, and a thin outside blade; the latter at the inner end vanishes almost insensibly into the rod, and at the outer end is gathered up into the sides of the trowel. The end of the instrument has a very different appearance according to which way we look at it. Viewed from above, it is sharp-pointed and conical; but from the side it reminds one of a garden trowel, that is to say, it is hollow, with the sides deepening as they extend back from the point. Its edge is served with a few irregular and shallow indentations, fitting it the better for cutting its way into the acorn stalk. The visceral tube ends immediately behind the trowel in a pair of large transparent flaps, which, I am inclined to think, embrace the sides of the acorn stalk and guide the point of the egg into the cavity prepared for it.

The ovipositor plate lies so close under the sheath, and is so bound to it by the soft tissues, that it is no easy matter to separate them, and it can seldom be done without mutilation of one or both. I therefore give a figure of the parts of *A. fibulella* (Fig. 8), in which I fortunately succeeded, after division of the soft parts, in slipping the plate from under the sheath without material injury to either, the only remaining bond of connection being the fibres of the protrudor muscles of the ovipositor. It will be noticed that the form of the sheath is distinctly (though not essentially) different from what it is in *viridella*, but there is much less difference in the subplates of the ovipositor, and the diagram represents very well the character of these parts in *viridella*.

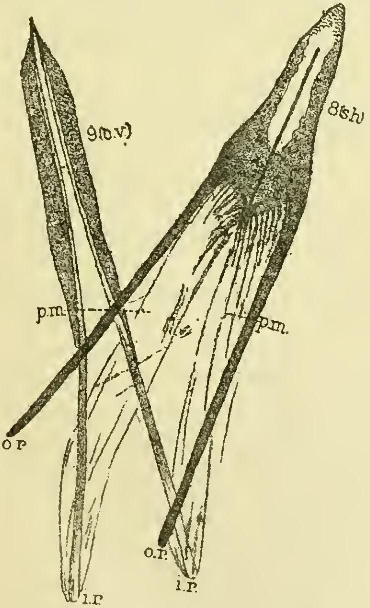


Fig. 8.

(*To be continued.*)

Fig. 8.—Ovipositor and sheath of *A. fibulella*. p.m, Protrudor muscles of ovipositor.

NEW GENERA OF *AGDISTIDÆ* AND *PTEROPHORIDÆ*.

BY THE RIGHT HON. LORD WALSINGHAM, M.A., LL.D., F.R.S., &c.

The following species will shortly be figured with structural drawings in "Novitates Lepidopterologicæ."

AGDISTIDÆ.

ATOMOPTERYX, *gen. nov.*

Type *Atomopteryx Doeri*, Wlsm.

Antennæ as long as the fore-wings; basal joint slightly enlarged, rounded; simple at the base, slightly serrate beyond the middle.

Maxillary palpi obsolete.

Labial palpi porrect, extending about the length of the head beyond it, roughly clothed, laterally compressed; first joint dilated, large and tufted beneath; second joint longer than the first, tufted; apical joint very minute.

Haustellum well developed, clothed along the basal portion.

Fore-wings narrow at the base, becoming wider beyond it, more than three times the width of their base opposite the anal angle; costa slightly arched beyond the middle, rather pointed at the apex, apical margin convex and very oblique. *Neuration* agreeing approximately with that of *Agdistis*, but veins 8 and 9, which run to the costal margin above the apex, are from a common stem; there appear also to be some supplementary veins about the end of the cell which probably assist the folding of the wing in an attitude of repose.

Hind-wings rather triangular, dilated at the abdominal angle, hind-margin slightly concave. *Neuration* differing from *Agdistis* in having veins 3 and 4 from a common stem.

Abdomen slender, fringed at the sides; the genital segments in the ♂ strongly developed; uncus short, reaching to scarcely half the length of the long lateral claspers, it is supplemented by a brush of hair-like scales expanding posteriorly to the length of the uncus itself.

Legs long and slender; posterior pair with the femora much shorter than the portion of the tibia above the first pair of spurs; spurs short, inner spur very slightly longer than the outer.

This genus is undoubtedly allied to *Agdistis*, Hb., but approaches *Stenoptycha*, Z., and *Scoptonoma*, Z., not only in neuration, but also in the form of the palpi, which are less abrupt and rather more developed than in *Agdistis*. In the fore-wings there is an elongate triangular fold extending inwards from the apical margin, but much less transparent than in *Stenoptycha*, this character, as well as the shape of the fore-wings and the structure of the posterior legs, show that *Atomopteryx* may fairly be regarded as a connecting link between *Stenoptycha* and *Agdistis*.

ATOMOPTERYX DOERI, *sp. nov.*

Antennæ pale fawn.

Palpi pale fawn at the sides, streaked longitudinally above and beneath with brown.

Head fawn-brown, slightly paler above.

Thorax fawn-brown.

Fore-wings fawn-brown, very sparsely sprinkled longitudinally with darker (almost fuscous) scales; the scales on the fold are slightly paler than the colour above or below it; a darker marginal line runs around the apex and lateral margin; cilia shaded with brownish-fuscous along their middle, pale cinereous at their ends and base, tipped with fuscous at the anal angle. Exp. alar., 22—24 mm.

Hind-wings slightly paler than the fore-wings, with a more greyish tinge; cilia shaded with brownish-fuscous along their middle, pale cinereous at their ends and base.

Abdomen the same colour as the hind-wings, with the ferruginous blotches on each side before the middle, followed by dark scales fringing the segments on which they are placed, these do not extend across the body.

Hab. : Brazil, Petropolis (*Doer*).

Type, ♂ ♀, Mus. Wlsm.

I am indebted to Herr H. Doer of Petropolis for two specimens (♂ & ♀); there is also a single specimen in the Zeller collection, its expanse is only 16½ mm., but it appears to be the same, or certainly a very closely allied species. It is without locality, but was probably collected by Baron von Nolcken in Colombia.

OCHYROTICA, *gen. nov.*

Type *Ochyrotica fasciata*, Wlsm.

Antennæ stout, slightly pubescent on the under-side; basal joint elongate, but scarcely enlarged.

Maxillary palpi obsolete.

Labial palpi projecting the length of the head beyond it; second and apical joints approximately equal, apical joint depressed.

Haustellum long, slender, naked.

Head tufted above with bifid spatulate scales.

Fore-wings undivided, costa straight, apex slightly depressed and pointed, apical margin scarcely concave, anal angle rounded. *Neuration*, 12 veins, 8 and 9 from a common stem, 8 to costa above apex; 3 and 4 from a point; rest separate.

Hind-wings undivided, narrow, costal margin rather straight, dorsal margin evenly convex, scarcely indented below apex, not scalloped. *Neuration*, 7 veins, all separate.

Abdomen ornamented and tufted above, somewhat fringed at the sides.

Legs, anterior pair with a brush-like collection of scales around the first tarsal joint; posterior pair with two pairs of long equal spurs and fringes of long projecting scales on the legs above them.

This genus, although it has only 7 veins in the hind-wings which partake somewhat of the form of those of *Agdistis*, differs widely from it in the form of the palpi, in the possession of bifid scales with which the head is tufted, and in the distinctly spurred and tufted hind-legs, a character found in *Eucnemidophorus*, Wlgrn., in *Cosmoclostis*, Meyr., and in *Oxyptilus*, Z. I cannot but regard it as a connecting link between these genera and *Agdistis*, to which its affinities are more nearly inclined.

OCHYROTICA FASCIATA, *sp. nov.*

Antennæ whitish, spotted with pale ferruginous.

Palpi whitish, touched with pale ferruginous at the sides, the base with a small ferruginous spot.

Haustellum whitish.

Head pale ferruginous, covered with a brush of erect hair-like scales, each of which is distinctly flattened and furcate at its apex.

Thorax white, with a ferruginous band along its anterior margin, reaching to the base of the wings on each side.

Fore-wings white, sparsely speckled with ferruginous scales; the costal margin ferruginous throughout, as are also the apical and the whole outer portion of the dorsal margin, this colour can also be traced towards the base, but is interrupted before the middle; a triangular ferruginous fascia commencing before the outer third of the costa is attenuated downwards to the ferruginous shade on the dorsal margin, thus completely enclosing the white central portion of the outer third of the wing by a narrow ferruginous band, this portion is slightly tinged, as well as speckled with pale ferruginous; on the middle of the apical margin is a slight inverted ferruginous tooth-like projection; cilia at the apical margin ferruginous at the base, forming part of the dark marginal band, but externally pale inclining to ochreous; a slight fuscous streak runs through them at the anal angle, and a second, less conspicuous, opposite the transverse fascia. Exp. alar., 14 mm.

Hind-wings brownish, cilia paler.

Abdomen wanting.

Legs, anterior pair tinged with ferruginous, whitish at the joints; posterior pair with alternate bars of ferruginous and white; first pair of spurs scarcely exceeding the second pair in length, both pairs indistinctly barred; the erect fringes at their base tipped with dark ferruginous.

Hab.: BRAZIL, Espiritu Santo (*Schmidt*).

Type, ♂, Mus. Wlsm.

I purchased this specimen some years since from M. Deyrolle in Paris.

I add further details from a specimen in the collection of Mr. Herbert Druce, from Central America.

Abdomen brownish at the base, whitish beyond it, with crossed bars of ferruginous forming a letter X before the middle; a ferruginous transverse band beyond the middle; anal segment ferruginous; the posterior edges of the white portions of the abdomen have the appearance of raised fringes marking the ends of the segments.

Fore-wings with an irregular fasciaform ferruginous marking before the middle of the dorsal margin; the dorsal margin is distinctly tinged with ferruginous throughout.

(To be continued).

"*The New Forest: projected spoliation.*"—Before attempting to reply to the question raised by Mr. C. A. Briggs in his note on page 200, *ante*, it will be necessary to consider what the rights of the Crown are over the Woods of the New Forest.

The total area within the boundaries of the Forest comprises some 92,365 acres, of which upwards of 27,000 acres are private property, 125 acres are Copyhold of Her Majesty's Manor of Lyndhurst, 600 acres are Leasehold under the Crown, 500 acres are Enclosures belonging to Lodges, and 1000 acres are *private* Woods and Plantations of the Crown, leaving about 63,000 acres for the "Woods and Wastes" of the Forest. Prior to 1698 the whole of these "Woods and Wastes" were open and unenclosed, but under the authority of the Acts 9 and 10 Will. III, c. 36 (1698), and 48 George III, c. 72 (1808), the Crown was empowered to enclose and keep enclosed freed and discharged from all rights of common such quantity of land in the Forest as would amount to 6,000 acres for the growth of timber.

By the Deer Removal Act of 1851 (14 and 15 Vict., c. 76), the Crown was authorized to enclose and plant with trees any quantity of land not exceeding 10,000 acres, in addition to the 6000 acres already in enclosure under the authority of the Acts before mentioned; and the 4th Section of the last mentioned Act provided "that the said Enclosures so made and set out as aforesaid shall remain in "the actual possession of the Crown freed and discharged of and from all rights of "common * * * * during the period of the same remaining so enclosed *for* "*the growth and preservation of timber and trees.*" The powers conferred by these Acts were not repealed by 40 and 41 Vict., c. 121 (the New Forest Act, 1877), but the rights of enclosure were by section 5 of the last cited Act limited to "such lands "as are at the date of the passing of this Act enclosed, or as have previously to such "date been enclosed, by virtue of Commissions issued in pursuance of the said Acts "or some of them."

It will be seen from what is above stated that the Forest Woods or Enclosures are of two kinds, namely, (1) Private Woods and Plantations of the Crown; and (2) such portions of the "Woods and Wastes" as have been enclosed under the authority of the Acts, or of some of them, above cited.

It would appear to me that if the two Enclosures referred to by Mr. Briggs (namely, Coxleaze Plantation and Iron's Hill Park) were enclosed under the authority of any of the Acts above cited, their enclosure was, under those Acts, limited for *the purposes of the growth and preservation of timber and trees*; and the letting or selling of such Enclosures, or any part of them, for the purposes of Building Sites would be *ultra vires*. It is within my own knowledge, however, that Iron's Hill Park is not a part of the "Woods and Wastes" of the Forest, but is one of the private Woods of the Crown, and belongs to Her Majesty in virtue of her office, as Lady of the Manor of Lyndhurst; and therefore neither the general public, nor any persons in the Forest possessing common rights, can, I fear, prevent the Commissioners of Woods from selling or letting this Plantation for any purposes which appear to them desirable.

I am afraid it will be found on enquiry that Coxleaze Plantation is also one of the private Woods of the Crown, and consequently, the remarks which I have made on the rights of the Commissioners of Woods over Iron's Hill Park are also applicable to this Plantation.

If, however, Coxleaze is an Enclosure which was made under the authority of any of the Acts before cited "for the growth and preservation of timber and "trees," it would seem probable that the Commissioners of Woods will be acting *ultra vires* in selling or letting the same, or using it for any other purposes.

I would suggest to Mr. Briggs that he should put himself in communication with the Hon. Auberon Herbert, who is constantly watching the action of the Commissioners of Woods, and the Deputy Surveyor of Woods and Forests at Lyndhurst, in regard to the Forest.

Many of the happiest hours of my life, from the age of 13 years, having been passed in the Enclosures above referred to, I deeply regret to hear of the probability of their destruction. In Coxleaze Enclosure my first specimen of *Aporia cratægi*—a straggler—was taken, and in 1864 I there caught my only specimen of a melanic variety of *L. Sibylla*. This Wood was also a favourite locality of mine for "sugaring," and has furnished me with large numbers of *D. Orion*, *L. turca*, and other local species. Iron's Hill Park was, in my experience—excepting always Hurst Hill Enclosure—the best locality in the Forest for *Catocala promissa* and *C. sponsa*, and was apparently the head-quarters of *Triphæna subsequa*.—H. Goss, Surbiton Hill: *July 1st*, 1891.

Dianthœcia Barrettii in North Devon.—When staying at Ilfracombe in July, 1879, I took a *Noctua* which much puzzled me. I caught in on flowers of *Silene maritima* by lamplight, but until now have not found any one who would venture to give it a name. One friend suggested the genus *Hadena*, and thought it might be *dentina*, while another thought it more like *chenopodii*. Then it was proposed to call it a *Mamestra* or *Apamea gemina* or *oculea*. For my own part I always thought that it was a *Dianthœcia*, and now I hear from my friend Mr. Barrett that he has no doubt that it is really a variety of *Dianthœcia Barrettii*.—W. C. Boyd, College Road, Cheshunt: *July 9th*, 1891.

[This specimen is, undoubtedly, most perplexing. It is a ♀, with large full abdomen, and the ovipositor so completely withdrawn, that it does not strike one as a *Dianthœcia* at all, while its resemblance to *Hadenæ* of the *dentina* group is quite remarkable. On the other hand, its markings almost exactly agree with those of *Dryobota roboris* (a south European *Noctua*, and an oak-feeder), and it was with difficulty that it could be with certainty identified. It differs from Irish specimens of *Barrettii* in the browner ground colour, and less distinct markings, and more resembles the unique Welsh specimen reared by Mr. W. H. Blandford, from which, however, it differs in tone of colour, being somewhat greyer, and also having the markings more obscure. Strange to say, it, like Mr. Blandford's specimen, bears no greater resemblance to the supposed typical form, *luteago*, than do the Howth specimens. This is, as far as I know, the first instance of the occurrence of *Dianthœcia Barrettii* in England proper.—C. G. B.]

Dioryctria splendidella, Rag., in Suffolk.—In the latter part of last month I went down to Denton, Norfolk, to join my friend the Rev. C. T. Cruttwell, in a vigorous effort to work out a new *Coleophora* which he has taken there. In this we were eminently *un*successful, and on the whole we did not find the results of hard work by any means what appeared to be promised by the richness and well-wooded character of the district. Perhaps our most satisfactory find there was *Œcophora tripuncta*, in some plenty, showing a special partiality for the maple bushes in the hedge sides.

One day Mr. Cruttwell drove me over to Southwold, a lovely drive of twenty miles, and to a rather attractive looking bit of coast, but disappointment followed us: *Plutella cruciferarum* swarmed at every step, and nothing else could be found, so my friend went inland to beat hedges, and I remained to idle about the sea-side, and watch the evolutions of some terns and ring dotterels. By and by Mr. Cruttwell came back with the results of hedge beating—one *Eupithecia togata*, and one *Dioryctria splendidella*. My astonishment may be imagined, not a single spruce fir could be seen for miles, and he had seen none. Then we strolled towards some bits of salt marsh, and on passing a wooden building another *splendidella* was descried sitting under a batten, and upon another building two more—which last were only secured by the intervention of natives with a long ladder,—and on further search we found two more *splendidella*, six in all, several of them very large and handsome. I simply record what we found. I can offer no explanation. No spruce firs, nor, as far as I saw, *any* firs appeared to be nearer than two or three miles. Had all the specimens been about the wooden buildings, the conclusion would have been irresistible that some one had gathered a vast number of cones and brought them there. But it appeared that nothing of the kind had been done, and the specimen of *splendidella*, with *togata*, in a hedge more than a mile distant would still have remained unaccounted for. The theory of immigration even suggested itself, but the specimens were in beautiful condition, and could hardly have flown many miles. Perhaps we ought to have accepted our good fortune with thankfulness, and not troubled our heads about "whence!" In the salt marsh were *Eupœcilia vectisana* and *affinitana*, with *Sericoris littorana*, *very* sparingly, and with our twenty miles drive before us we devoted little time to them.—C. G. Barrett, 39, Linden Grove, Nunhead, S.E.: *July* 10*th*, 1891.

Cosmopteryx orichalcea in Wilts.—Early in June last I was surprised and pleased to have a fresh specimen of this apparently local insect brought me by one of the most active of the College collectors, E. I. Claxton. We subsequently revisited the locality, and obtained about a dozen more. They occurred on the exposed slope of a dry railway embankment, and, seemingly, only in a very limited space, where the vegetation was somewhat different. I hope, later on, to identify the grass to which they are attached.—E. Meyrick, The College, Marlborough: *July 7th*, 1891.

Leptura scutellata, &c., in Windsor Forest.—On behalf of Mr. J. B. Bowring, I have to record the capture of a considerable number of this usually scarce Longicorn in a stump about ten feet high in Windsor Forest. On the same stump a large number of *Tillus elongatus* were also found, in company with *Ptilinus*. Mr. Bowring kindly sent me several specimens of the *Leptura* alive; both the male and female stridulate in the same manner as *Agapanthia lineatocollis*, by moving the thorax forwards and backwards. The characteristic pubescence of the scutellum is silvery in the males, which are considerably smaller, and golden in the females. On July 10th Mr. Bowring captured several specimens flying about the stump; they fly readily and strongly, and make a loud noise in flight. *Callidium variabile* and *Phlœotrya rufipes* have also occurred in considerable numbers at the A butts in the Park, and *Tiresias serra* has recently been found sitting outside a burrow of *Xestobium tessellatum* in the Forest. Mr. Bowring has also asked me to record the following:—From the New Forest—*Trox sabulosus, Elater elongatulus, Corymbites metallicus* and *bipustulatus, Mesosa nubila, Cleonus nebulosus,* and *Conopalpus testaceus.*

From Ugbrooke Park, near Chudleigh, Devon, a fine specimen of *Strangalia aurulenta*; this corroborates the records given in my work on the British *Coleoptera,* vol. iv, p, 239, "Between Barnstaple and Bideford, Devon (Stephens); Plymouth (J. H. Keys)." I have already recorded in this Magazine the capture of *Platyrrhinus latirostris* in this part by Mr. J. C. Bowring (Vol. i, New Series, p. 110).

From Bovey Tracey, Devon—*Leptinus testaceus* and *Pachyta cerambyciformis* (*octomaculata*). With regard to the former, which occurred in some numbers, Mr. Bowring writes—"I took them on August 19th, 1890, on a live mole, the beetles getting off it on to my handkerchief in which I put the mole for a few minutes, and as it was not until afterwards that I found them, there were probably many more on the animal." This is the first record of the occurrence of *L. testaceus* in the south-western or western counties; it is, however, in all probability, generally distributed throughout England, but is seldom met with. It has been recorded from the Hastings district, the London district, Needwood near Burton-on-Trent, and Ripon; and also from the Clyde and Forth districts of Scotland. It is found in dead leaves, birds' nests, on small rodents, in the nests of humble bees, and very rarely in ants' nests.—W. W. Fowler, Lincoln: *July* 14*th*, 1891.

Barynotus mœrens, Fab., destructive.—A friend of mine is greatly exercised by the havoc which a beetle (kindly identified for me by the Rev. Theodore Wood as the above) is making among her lilies of the valley. She first noticed the insects about three summers ago. This year they are specially numerous; up to July 4th she had killed 580 of them—80 on one evening. They do not show themselves until after 10 p.m. The beetles devour musk, violets, primrose, and foxglove (especially the two latter), as well as lilies of the valley. A large chestnut overhangs the lilies, and a fernery runs at the back, but they do not touch the tree, and do very little damage to the ferns. As far as my friend can make out, the eggs hatch in August. The larvæ did no end of harm last year to the lily roots, and filled the bulbs of the tiger lilies and gladioli growing close by. The perfect insect attacks foliage only, sitting astride the leaf, and eating in rings like the clover weevil. It has completely destroyed two beds of lilies of the valley out of the three in the garden, and the birds do not seem to carry it off. Can any of your correspondents supply me with information on the following points? (1) What is the best means of preventing the depredations, and killing the larvæ? (2) Where are the eggs laid? (3) Is it probable that these insects were brought with ferns from Wales, or bulbs from Germany? (4) What is the ordinary food plant of *B. mœrens*?—M. C. H. Bird, Brunstead Rectory, Stalham, Norfolk: *July* 8*th*, 1891.

[As a rule the beetle above alluded to, *Barynotus elevatus*, Marsh. (*mœrens*, *auct. nec* Fab.), is by no means common; in fact, there are many Coleopterists who would be glad of a good series for their collections. This is the first time that I have ever heard of it as being destructive, nor do I know of any record of its life-history; hitherto it has been found in Britain very locally under stones, in moss, flood refuse, &c. I have never taken it except in Bretby Wood, near Ripon, Burton-on-Trent, where it occurred somewhat commonly in early summer on bracken. The beetle might have been introduced with ferns from Wales, but it is more probable that it came in the lily roots, as these seem to be attacked much more than the ferns. The eggs are probably laid, as in the case of *Otiorrhynchus sulcatus*, a little below the surface of the ground. The last named beetle sometimes attacks strawberry plants; in this case Miss Ormerod (Manual of Injurious Insects, 2nd Edition, p. 363) recommends that the kind of shelter preferred by the insect should be discovered, and that by placing some of this (whether slates, tiles, odd bits of thin turf, or morsels of old waste sacking) on the ground by the plants, they would probably form excellent traps, which might be cleared daily with very little trouble.

The destruction of the full grown insect will of course diminish the larvæ, but as larvæ they are very hard, if not almost impossible to get rid of, as applications that will destroy them will also kill the plants; watering, however, with a "strong solution of ammoniacal liquor and common agricultural salt" has been found of service in like cases. The only real method of getting rid of them is to root up all the affected plants and those in their neighbourhood, and then to treat the ground with a strong dressing of gas lime, and allow it to be fallow for some time before replanting.—W. W. F.].

Otiorrhynchus sulcatus destructive to ferns, &c.—Your editorial comment on Mr. Wood's note on *Otiorrhynchus sulcatus*, in the July No. of Ent. Mo. Mag., reminds me of an incident in my experience which has hitherto puzzled me, but which may perhaps find a solution in a similar way. I have for some time past grown large numbers of plants of the little saxifrage, known popularly as "Mother of Millions," on an imitation rockery made of virgin cork. I have often noticed that here and there plants have suddenly begun to wither, and on examining them, I invariably found the plant completely severed from its root, a hollow being excavated in the stem at the junction with the root just below the rosette of leaves, and in this cup-like hollow was a fat white grub. I have never succeeded in rearing them, as they always died when thus disturbed. But a few days ago I found an *Otiorrhynchus sulcatus* in the conservatory in which the rockery is situated. Is it likely that the larva was that of the beetle, and, if so, do you know of any other instances of a similar damage? I have not found maidenhair or other ferns attacked in this way, but always the saxifrages.—E. A. Butler, 39, Ashley Road, Crouch Hill, N.: *June 29th*, 1891.

Notes on Coleoptera in the North of Ireland.—Since my last note (2nd series, vol. i, p. 295) I have the following additions to the Irish list:—*Hydroporus umbrosus*, taken on Carlingford Mountain, Co. Louth, and in the Mullinure meadows here. *Homalota luteipes*, in moss from Mullinure; *H. atricolor*, in moss from the Palace Demesne; *H. pygmæa*, in moss from Lowry's Lough; *H. luridipennis*, in flood rubbish from Mullinure. I am indebted to Mr. A. C. Horner, of Tonbridge, for kind assistance in determining these *Homalotæ*. *Mycetoporus lucidus*, in moss from Mullinure. *Oxytelus Fairmairei*, in flood rubbish from Mullinure. *Meligethes lumbaris*, sweeping herbage at Lowry's Lough, in June. *Acritus minutus*, several taken in a hotbed by one of my pupils. *Byrrhus fasciatus*, on Carlingford Mountain, and on Deadman's Hill, near Newtown Hamilton, in this county. *Anaspis subtestacea*, taken by Rev. S. A. Brenan at Cullybacky, Co. Antrim. *Tropiphorus carinatus*, in moss from Mullinure. Besides these, I may mention *Bembidium Doris*, of which I have taken some examples in flood rubbish from the Mullinures, and in moss from the edge of Lowry's Lough. On March 9th last, I was driven up to Newtown Hamilton, and got a couple of bags of moss from that vicinity. These produced *Bradycellus cognatus*, *B. similis*, *Acidota crenata*, *Tachyporus transversalis*, and a couple of *Mantura chrysanthemi*, of which I had taken a single specimen previously in moss from the Vicar's Cairn, at an elevation of 800 feet. The present locality is fully as high. *Hydroporus obscurus* is plentiful in a pond about half way up Carlingford Mountain, and in a bog near Vicar's Cairn. *Salpingus æratus* occurred in moss about stumps of fir trees near this. The only other Irish record appears to be Dr. Power's, near Dublin. In moss from the Palace Demesne, mostly from about tree stumps, I took, in March, *Rhizophagus cribratus* and *R. perforatus*; Mr. J. J. Walker records both from Galway, so they are probably widely distributed.

On April 4th, there was a flood in the Mullinures, owing to the heavy rains, so as soon as the weather permitted, I hurried down with my bags. The rubbish was not yet deposited, for the flood had not reached its height, so I took my water net, and fished out all I could carry, and I must say the result was most satisfactory, and I feel sure I took many species which, had I waited for the subsidence of the waters, would have escaped me. Of course, it makes the carrying of the bags a damp business, in fact, I was wet through, but that is a trifle compared to the gain in captures. Some idea may be formed of the numbers which were contained in this rubbish when I mention that Mrs. Johnson had to take a clothes brush and brush me down, so covered was my coat after sorting the contents of my bag. One of my captures astonished me very greatly. This was *Pelophila borealis*, of which a single specimen made its appearance. I never expected to see it in the Mullinures, which is quite unlike any of the other localities in which I have taken it. I have ascertained by experiment that it will hibernate, and probably does so naturally, but I have never met with it in the moss which I have from time to time gathered at Lowry's Lough. Judging from what it did with me, it burrows into the ground and lies dormant till the warm weather brings it out I also took *Bembidium æneum*, which had not appeared in this immediate vicinity previously; *Agabus unguicularis*; *Dytiscus circumcinctus*, a fine ♀; a single specimen of *Helophorus nubilus*, also new to this district; a few *Megacronus cingulatus*; *Lathrobium quadratum* and *L. longulum*, both of these are tolerably numerous here; and one *Erirhinus æthiops*. The season is terribly backward, and sweeping practically useless; I worked hard at it yesterday morning, and could get nothing but some common *Apions*, while off some willows I beat a number of *Phratora vitellinæ*, which were devouring the young leaves at a great rate.—W. F. Johnson, Winder Terrace, Armagh: *May 26th*, 1891.

Microdon mutabilis, L.—The record of the capture of this very curious Dipteron fly, which at first sight, when at rest, may be mistaken for a bee or a saw-fly, will prove, no doubt, interesting to Dipterists. The first capture was made by my friend Mr. F. C. Lemann, on the 16th June; after being identified by Mr. Coryndon Matthews, finding that Mr. Verrall had placed it in his list in *italics*, as much as to say it was a doubtful British species, it gave me a greater desire to capture others; consequently, my friend Lemann and I journeyed to the locality at Ivybridge on the 21st, and were rewarded with three additional specimens, two of them falling to my net: it was a glorious sunny day, we observed that they took very short flights a few inches above the ground, and again settled on the grass, the three captures taking just as many hours, therefore, they may be called scarce, and the locality local, not covering more than twenty square yards.

The National Collection, I believe, did not possess a British specimen until I presented one of the above-mentioned captures.

According to Schiner (Fauna Austriaca Diptera) the life-history appears to have been worked out, for he says:—"The metamorphosis of the different species is known; the larvæ resemble small slugs, and would at first be taken for such; they are flat and fleshy on the under-side, the back is arched and appears moistened; they have been found in the nests of *Formica fusca*, and under the bark of a species of willow. The imagos are found in wet places, where they sit on the under-sides of leaves, and in the grass, and may often be taken in great numbers by sweeping—they make a humming noise during flight, and have little resemblance to the other genera of *Syrphidæ*."

The humming noise produced during flight can also be produced when not in motion; on removing the lid of the box on the following morning to make a closer inspection of the first capture, I was rather surprised to find it was able to make a humming noise when annoyed, a beautiful undulating sound; it was some time before I could discover how it was produced, seeing the fly apparently did not move; at last with a powerful lens I discovered that it was by its poisers vibrating, and I believe coming in contact with some short bristly hairs situated on the abdomen, and pointing towards the thorax; the undulations were caused by the rapidity with which the poisers were moved.—G. C. Bignell, Stonehouse, Plymouth: *July 1st*, 1891.

Hypoderma bovis, *Deg.*—This species, which was identified by Mr. C. Matthews, was captured on the 9th June, on the moor between Yelverton and Clearbrook; the hairy body in three colours, white, black, and red, giving it a very bee-like appearance.

This is a sub-cutaneous parasite on cattle, and very seldom taken in the imago state.—Id.

180 *parasites in one larva of Arctia Caja.*—I was passing by a field on the 20th of last month (June), when I saw crossing the pavement in front of me a larva of *Arctia Caja*; I immediately boxed it (as I capture all I come across, in the hope of breeding varieties); I left the larva in the same box for about six hours, when, looking at it again, I saw it almost covered with maggots. I left these, along with the *Caja* larva, for three or four days, in which time they spun up and emerged; they proved to be *Apanteles Cajæ*. I afterwards counted the cocoons, and found there were no less than 180. Is not this an unusual number?—A. E. B. Wood, Garfield Lodge, Stoke, Devonport: *July 2nd*, 1891.

Review.

Révision des Rhaphidides: par Herman Albarda (Tijdschrift voor Entomologie, xxxiv, pp. 65—184, avec 10 planches, 1891).

This Monograph is a very valuable contribution on a small group of Neuropterous insects, remarkable in their structure and also in their habits. The whole bibliography is worked out chronologically, the synonymy determined for the most part from types, and each species is described and figured in great detail, the figures referring to the head and pronotum, wings, and anal parts. The two existing genera —*Rhaphidia* and *Inocellia*—are retained undivided. The group is essentially Palæarctic and Nearctic, the species of the former division extending eastward to Japan, those of the latter represented only in occidental North America (in fact, a further eastward extension of the Palæarctic element). Of *Rhaphidia* the author describes 21 Palæarctic species (7 new), and 4 Nearctic (2 new). Of *Inocellia* there are 3 Palæarctic (2 new), and also 3 Nearctic (2 new). The greatest care is shown in the descriptions and figures, especially as to neuration and anal appendages, the former being worked out very minutely so as to distinguish between actual specific characters and individual variation. To some we think that less finished (*i. e.*, more purely diagrammatic) figures of the anal parts would have proved more intelligible; but that is a matter of opinion. The European distribution is general (4 only having been observed in Britain), but several of the rarer or new species are Mediterranean. We have no space for analysis, but congratulate the author and entomologists on the successful conclusion of the work. The idea emanated from the writer of this notice, who, in asking the author to determine the materials in his collection (160 Palæarctic and 58 Nearctic specimens), suggested a Monograph; that the suggestion was a useful one the sequel has proved.—R. McL.

Obituary.

Henry Edwards.—With great regret we notice an announcement, from an American source, of the death of Henry Edwards, a man of great originality—actor, theatre proprietor, and entomologist—an Englishman by birth, an emigrant on professional duties to Australia and New Zealand, a settler in America, firstly in California, afterwards in the Eastern States, where he died. We hope to be able to give more precise details of his history in a future number. The, to some, apparent antagonism of theatrical and scientific pursuits has more than once proved a fallacy. "Ochsenheimer and Treitschke" are familiar names to all Lepidopterists, the majority being probably ignorant of their history, other than that their names appear as "sponsors" for many species. We could cite other cases, and even amongst students of entomology now here in England. Henry Edwards did much good work, both as a collector and writer. No. 35 of the "Bulletin of the United States National Museum" (Smithsonian Institution, 1889), consists of a "Bibliographical Catalogue of the described transformations of North American *Lepidoptera*," with references to more than 1000 species: this was probably his last work of importance.

Ferdinand Grut, F.L.S.—The news of the death of Mr. Grut, Honorary Librarian to the Entomological Society of London, on July 19th, aged 71, will come upon the Fellows of the Society, and a large circle of private friends, as a shock. Although not in good health for a long time, he was constantly present at the Society, and at the meeting on July 1st he seemed better, and in better spirits, than usual. This is a preliminary announcement.

Society.

ENTOMOLOGICAL SOCIETY OF LONDON: *July 1st*, 1891. — FREDERICK DU CANE GODMAN, Esq., M.A., F.R.S., President, in the Chair.

The Rev. John Isabell, of St. Sennen Rectory, Penzance, was elected a Fellow of the Society.

Mr. Jacoby exhibited a specimen of a species of *Coleoptera* belonging to the family *Galerucidæ*, with the maxillary palpi extraordinarily developed.

Canon Fowler, on behalf of Mr. Wroughton, Conservator of Forests, Poona, exhibited specimens of a bug imitating an ant, *Polyrhachis spiniger*, and a spider imitating a species of *Mutilla*, and read the following notes:—"I have taken a good many specimens of a bug which has achieved a very fair imitation of *Polyrhachis spiniger* (under the same stone with which it may be found), even to the extent of evolving a pedicle and spines in what, were it an ant, would be its metanotum. Curiously enough, however, these spines are apparently not alike in any two specimens. Is it that this bug is still waiting for one of its race to accidentally sport spines more like those of *P. spiniger*, and thus to set the ball of evolution rolling afresh? or is it that the present rough copy of *spiniger's* spines is found sufficient to deceive? The bug has also been found in the Nilgherries. Mr. Rothney remarks on the above species:—'I have not found the species mimicking *Mutilla*; but in Calcutta and Barrackpore, where *P. spiniger* is a tree-ant, forming its net by spinning together the twigs of a shrub, the mimicking bug also assumes arboreal habits, and may be found on the trunks of trees with the ants.'"

Mr. Porritt exhibited living specimens of *Eupithecia extensaria* and *Geometra smaragdaria*: the position assumed by the former proved conclusively that it had rightly been placed in the genus *Eupithecia*.

Mr. Crowley exhibited two specimens of a *Papilio* from the Khasia hills, belonging to an undescribed species allied to *P. Papone*, sub-generic section *Chilades*. Col. Swinhoe remarked that he possessed a specimen from Northern Burmah. Mr. Moore and others took part in the discussion which followed.

Mr. Dallas Beeching exhibited a specimen of *Plusia moneta*, recently taken by himself at High Woods, Tonbridge, and specimens of *Gonepteryx Cleopatra*, lent him for exhibition, which were alleged to have come from the same locality.

Dr. T. A. Chapman exhibited the larva of *Micropteryx calthella*, and read the following notes:—"The larvæ were obtained by placing moths in a cage with damp moss, dead leaves, and other *débris* off the surface of the ground. Into this the moths crept to a depth of half-an-inch, forcing their way into narrow cavities, and laid their eggs in groups of six or twelve. The eggs are clothed with fine hairs, tipped with refractive particles. The larva, about a millimetre in length, possesses on each segment eight processes of a globular form, raised on a very slight pedicle. Besides the thoracic legs, each of the abdominal segments (eight) possesses a pair of minute jointed legs of the same type as the thoracic. There are also a pair of long jointed antennæ."

Col. Swinhoe read a paper, "On new species of *Heterocera* from the Khasia Hills."

Mr. Crowley read a paper, "On a new species of *Prothoe*."

Mr. C. J. Gahan read a paper, "On the South American species of *Diabrotica*," Part II, being a continuation of Dr. Baly's paper on the same genus, published in the Society's Transactions for 1890, Part I.

Mr. W. F. Kirby communicated a paper, entitled, "Notes on the Orthopterous family *Mecopodidæ*."

Prof. Westwood communicated "Notes on *Siphonophora artocarpi*," referring to an appendage of the eyes which had been overlooked in his previous description. —H. Goss and W. W. Fowler, *Hon. Secretaries.*

ANNOTATED LIST OF BRITISH *TACHINIDÆ.*

BY R. H. MEADE.

(Continued from page 157).

14.—NEMORÆA, Dsv.

NEMORÆA et PLATYCHIRA, Rnd.

Gen. ch.—Species mostly large, highly developed, and closely allied to each other; eyes hairy, more or less approximated in the male, but never contiguous, and always much shorter than the sides of the head; forehead prominent; antennæ drooping, with the second joint elongated, often nearly as long as the third; facialia bare; cheeks sometimes clothed with soft hairs; chin large, extending far below the eyes, and setose; abdomen oval, middle segments with or without discal setæ; fore tarsi more or less dilated in the females.

Rondani noticed that those species which have both marginal and discal abdominal setæ, which are by far the more numerous, have the fore tarsi of the females more dilated than those which are without the discal setæ; he therefore placed them in a separate genus, which he named *Platychira*; they resemble their congeners, however, so closely in all other characters that I think they should not be separated from them.

1 (4) Middle abdominal segments without discal setæ (*Nemoræa*, Rnd.).

2 (3) Abdomen black ……………………………………… 1. *glabrata*, Mgn.

3 (2) Abdomen red ……………………………………… 2. *rubrica*, Mgn.

4 (1) Middle abdominal segments with discal setæ (*Platychira*, Rnd.).

5 (6) Cheeks clothed with fine hairs ……………………… 3. *puparum*, Fln.

6 (5) Cheeks bare.

7 (18) Palpi yellow or rufous.

8 (9) Antennæ with basal joints yellow ……………………… 4. *strenua*, Mgn.

9 (8) Antennæ black.

10 (15) Thorax with three stripes.

11 (12) Scutellum with apex red ……………………… 5. *vagans*, Mgn.

12 (11) Scutellum black.

13 (14) Wings with cubital appendix ……………… 6. *appendiculata*, Meq.

14 (13) Wings without cubital appendix ……………………… 7. *nemorum*, Mgn.

15 (10) Thorax with four stripes.

16 (17) Thoracic stripes narrow, and placed at equal distances from each other ..
8. *rudis*, Fln.

17 (16) Thoracic stripes wide, and middle ones nearer to each other than to the outer stripes ……………………… 9. *consobrina*, Mgn.

18 (7) Palpi black.

19(20)(21) Abdomen marked with two well defined, broad, transverse, white bands ..
10. *radicum*, F.

20(19)(21) Abdomen marked with two broad, undefined, white bands or tessellations
11. *cæsia*, Fln.

21(19)(20) Abdominal bands very narrow, and wings with short cubital appendages
12. *intermedia*, Zett.

All the species of *Nemoræa* have the *thorax* black or grey, sometimes with a green or bluish tinge; it is always also more or less distinctly marked with either three or four longitudinal stripes, and whitened with grey tomentum on the front margin and sides; in my diagnosis of the different species I shall, therefore, only mention its colour when it varies from the ordinary type. The same remarks will apply to the colour of the legs, which is black or dark grey in all the species.

N. GLABRATA, Mgn.

I have not seen either a British or foreign specimen of this species, but have introduced it owing to its being recorded as British by Mr. F. Walker in the supplementary list of British Tachinids published in the Appendix to the second vol. of the Insecta Britannica.

N. RUBRICA, Mgn.

This and the foregoing species are the only two recorded British ones that belong to Rondani's restricted genus *Nemoræa*, in which the middle abdominal segments are without setæ on the disc. *N. rubrica* has the thorax marked with four longitudinal stripes of nearly equal width, and has four external dorso-central bristles behind the transverse groove; the scutellum is reddish-brown, the apex usually only being rufous in the female; the palpi and the two basal joints of the antennæ are red; the abdomen is reddish-yellow with a black longitudinal stripe, and shows white reflections; the wings are brown with yellow roots. Very rare.

N. PUPARUM, F.

This is distinguished from all the other recorded British species by having the cheeks below the termination of the fronto-orbital bristles clothed with a few fine scattered hairs.* The cheeks are white with black reflections, and the hairs upon them are pale in colour and not very easy to see. The chin is thickly covered with long hairs; the eyes are subcontiguous in the male; the palpi are yellow; the antennæ have the basal joints grey or sometimes red, and the third joint black-brown with the base often red; the thorax has three stripes, the central one being very wide, and four external dorso-central bristles behind the transverse groove; the scutellum is rufous; the abdomen is blackish-brown, the sides of the second and third segments being red in the male; the front borders of the second, third and fourth segments are also encircled with an even, wide, subinterrupted white band; the wings have the fourth longitudinal vein bent at an acute angle, the external cross vein sinuous, and the little cross vein nebulous. Rare.

N. STRENUA, Mgn.

This has the cheeks quite bare; the antennæ are in great part yellow, and paler in the female than in the male; the eyes in the male are subcontiguous; the peristome is red; the thorax is marked with four rather narrow stripes, and has four external dorso-central bristles behind the transverse groove; the scutellum is red, with the base mostly black; the abdomen is shiny black, having red sides in the male and indistinct white transverse bands; the wings are yellow at the base, with the external cross vein oblique and sinuous, and the little cross vein nebulous. Not common. I found both males and females in Oxfordshire in 1883, it is also in Miss Decie's collection captured at Westward Ho! and I received a specimen from Mr. Harwood of Colchester.

N. VAGANS, Mgn.

This differs from the former by having the antennæ more nigrescent, the apex of the second joint and the base of the third only being rufous; by the thorax being marked with three instead of four stripes, and by the scutellum being red only at the tip. Rare. Captured by Mr. C. W. Dale at Blair Athol in June, 1883; found also by Mr. Harwood at Colchester.

N. APPENDICULATA, Mcq.†

This has the eyes in the male rather widely separated, the frontal space occupying about one-fourth of the width of the head; the frontal stripe dark brown; the sides of frontalia and face yellowish-white with black reflections; the antennæ black, with the second joint nearly as long as the third; the arista with the second joint somewhat elongated; the palpi piceous;* the thorax with three stripes, and having three external dorso-median bristles behind the transverse groove; the scutellum quite black; the abdomen shiny greenish-black, with white tessellations on the sides, but no red; the wings have the fourth longitudinal vein bent at a right angle, and then forming nearly a straight and oblique apical cross vein, also giving off at the angle an appendix of moderate length, it occupying about one-third of the space from the angle to the margin of the wing; the external cross vein is nearly straight, the little cross vein is nebulous. I have only seen one specimen (a male) of this well-marked species, which was sent to me in January, 1891, by Mr. Dale for my inspection.

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* These characteristic hairs must not be confounded with others that are present on the sides of the frontalia in this and other species between the fronto-orbital bristles and the eyes.

† Ann. d. l. Soc. Ent. de Fr., 11, 6, 112.

N. NEMORUM, Mgn.

This rare species has been recorded as British by F. Walker, but I have not seen a specimen. It differs from *N. vagans* by having the scutellum quite black, the apical cross vein nearly straight, and the little cross vein unclouded; it may also be distinguished from *N. appendiculata* by the eyes of the male being sub-contiguous, and by the absence of the cubital appendix, as well as of the nebulosity of the little cross vein.

N. RUDIS, Fln.

The diagnosis between *N. rudis*, Fln., and *N. consobrina*, Mgn., is involved in a good deal of obscurity. Fallen's description of the former is very vague, and throws no light upon the subject. Rondani does not mention *N. rudis*, but his remarks respecting *N. consobrina* correspond with those applied to *N. rudis* by Meigen, Zetterstedt, and Schiner; all of whom say that the thorax in the latter species is marked by four *narrow* black lines. Meigen's description of *N. consobrina* is very brief, he only says that the thorax is marked by four stripes, stating nothing as to their width. Schiner is the only author who clearly defines the difference between the two species, and as I have specimens which correspond to his descriptions I shall follow them.

N. RUDIS, Fln. ?, Mgn., Zett. et Schn.
P. consobrina, Rnd.

Thorax marked by four narrow black stripes, which are equal in width and placed at equal distances from each other; external dorso-central thoracic bristles three in number behind the transverse groove; eyes in the male separated by an interval occupying about one-fifth of the width of the head, those of the female not much wider apart; antennæ black, tinged with red at the junction of the second and third joints, which colour is more marked in the female than in the male; palpi yellow; scutellum more or less rufous towards the apex; abdomen black, sides red in the male, and marked by grey tessellations in both sexes; wings with the apical cross veins much curved, the outer cross vein a little sinuous, and the little cross veins rather nebulous. Not uncommon.

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* Macquart says that they are black, with the bases testaceous.

N. CONSOBRINA, Mgn. ?, Sch. *non* Rnd.

Thorax striped in front by four wide black bands, the central pair of which are placed near together; posterior outer dorso-central bristles three in number; antennæ black; palpi yellow; scutellum black; abdomen as in *N. rudis*; wings with the apical cross vein rather oblique, and less curved than in *N. rudis*; the outer cross vein sinuous, and the little cross vein almost clear. Rare.

N. RADICUM, F.

This, the most common species in the genus, has the antennæ and palpi black, the latter being sometimes pale or red at the ends; the eyes are separated by nearly an equal interval in both sexes; the thorax has four rather narrow stripes, and three external dorso-central bristles behind the transverse groove or suture; the scutellum has the apex mostly red; the abdomen is shiny black, with two well defined broad transverse bands, and has the sides red, and somewhat diaphanous in the males; the wings are tinged with brown, and have the veins, especially the little cross ones, rather nebulous, and the apical cross veins much curved. Generally distributed.

N. CÆSIA, Fln.

This closely resembles *N. radicum*, but is quite distinct; the thoracic stripes are wider; there are four instead of three external dorso-central bristles behind the suture; the third antennal joint is shorter, being scarcely as long as the second; the abdomen has the sides irregularly tessellated with white, instead of being encircled with white bands; the wings are clearer, the little cross veins are unclouded, and the apical cross veins are more oblique and less curved. Very rare; I have only seen one British specimen, which was in the late F. Walker's collection.

N. INTERMEDIA, Ztt.

setosa ?, Mcq.

This species is of a bright blue-black colour, with a convex subcylindrical abdomen having large, recurved, subglobose anal segments;* the antennæ are rather short and black; the palpi are filiform and black; the frontalia are wide, the eyes of the male being more widely separated than in any other species; the thorax is marked with four indistinct black stripes, and has three outer dorso-central bristles behind the suture; the tip of the scutellum is red; the abdomen is of a bright shiny black colour, with the vestiges only of white interrupted bands; the wings have very short cubital appendices. *N. setosa*, Mcq.,† seems closely to resemble this species in form and colour, only differing by having the palpi yellow instead of black, and having no appendices to the wings, it is probably only a variety of the same. Very rare; I have only seen two examples (both males), which I obtained with other unnamed British species from the late F. Walker.

(To be continued). 263

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* The shape of the abdomen is very similar to that of *Cynomyia mortuorum*.

† Ann. d. l. Soc. Ent. de Fr., 11, 6, 116.

ENTOMOLOGICAL NOTES FROM PORT DARWIN, &c.

BY JAMES J. WALKER, R.N., F.L.S.

We arrived at Tanjong Priok on May 7th, but as we left again on the 9th at daybreak, and were busy coaling, &c., all the time, I had, to my regret, no chance of going on to Batavia. I had, however, a turn round the immediate vicinity of the harbour, but as the weather was rainy and unfavourable, I did not meet with very many insects. The country here is sandy and entirely alluvial and very swampy in places, though covered with dense vegetation, coco-nut palms predominating. There seemed to be a fair sprinkling of butterflies along the roads, &c., but mostly of small and comparatively inconspicuous kinds. I met with examples of three European species, viz., *Neptis aceris*, *Lycæna bœtica*, and *L. trochilus*. The commonest butterfly appeared to be a black and greenish-white *Danais*, which abounded in shady places. By brushing long grass with my net, I obtained a fair variety of small *Coleoptera* and *Hemiptera*, but the only conspicuous beetle I got was a beautiful blue Cicindelid, with red legs, which at first I mistook for an *Agra !*, it is, I believe, a species of *Collyris*. A beautiful little metallic Heteromeron, allied to *Helops*, found not rarely under logs, is also worth notice. On the whole, however, I was somewhat disappointed with Tanjong Priok, though it must be acknowledged that I had no good opportunity of collecting.

We had a fine view of the picturesque north coast of Java on our way to Timor, and especially of the fine volcano, "Gunong Agong" (10,500 feet), in the Island of Bali, as we passed through the Strait between that Island and Lombok on May 12th.

On the 13th our course lay between the Islands of Flores and Chandana (Sandalwood Island), but at too great a distance to see much of either of them; we also got a distant glimpse of Sumbawa.

On the 15th, at 8.30 a.m., we arrived off Koepang (Timor), and anchored about half a mile off the town. The country here is of moderate elevation, but very rugged, with some high mountain peaks in the background; it appears somewhat arid, but there is no lack of vegetation. A fine "fan palm," 100 feet or more in height (*Borassus flabelliformis*), is very conspicuous, and large Ficus and other trees are planted on either side of the principal streets of the town. Koepang, which is one of the oldest Dutch settlements in the East, is an exceedingly neat and clean place, with an abundant supply of water, but it is said to be unhealthy; there are but few European residents, most of the trade being in the hands of the Chinese. A fine stream comes down from the hills, just to the north of tl [illegible] and, having an opportunity of landing in the afternoon, I rambled along its bed for a couple of miles or so. Here I saw a good many insects, including the fine and rare *Papilio Œnomaus* (I think), but it kept well out of reach, and I got only one poor specimen. I also took a fine yellow *Ornithoptera*, the only one I saw. The commonest insect was a very beautiful *Pieris*, richly marked beneath with deep orange on a velvety black ground.

On the following day (16th) we moved over to the Island of Semao, about eight miles distant, where the Dutch Government keep a store of coal, and while we were coaling, I managed to get the forenoon on shore, and for the first time since leaving England, met with tolerable success in *Lepidoptera*. The very first butterfly I saw (and caught) was the rare and beautiful *Cethosia Leschenaultii*, unfortunately a little damaged; during the forenoon I took another in most beautiful order, and missed a third. The Island, for some distance inland, consists of upheaved coral rock, covered with dense brushwood and trees of moderate size, and very difficult to traverse; but I found a good path which extended for more than a mile through the bush, and here I was able to get some very satisfactory collecting. There were several *Papilios* (*Polydorus*, *Pammon* ?, &c.), and a fine blue species, allied to *P. Ulysses*, was seen once or twice, but it kept too high up to be caught; a very fine *Charaxes* was also seen several times, but I succeeded in getting only one very bad specimen. *Pieris*, *Callidryas* (some fine species), *Terias*, *Pontia*, and *Danais*, were well represented, and flying with the latter I got three beautiful specimens of a *Cethosia* (since found at Port Darwin, I think it will be *C. Penthesilea*, Godt.), deceptively like *Danais Chrysippus* on the wing. *Neptis aceris*, or a closely allied species, was very abundant, and a fine *Thestias* was more often seen than caught; altogether I caught or observed at least 35 species of butterflies, and brought off something like 100 specimens, quite as many as I could set out at once. The place was too dry for *Coleoptera*, although I tried beating, &c.; a species of *Mylabris*, very like some of the Mediterranean forms, was almost the only beetle observed, all the dead timber in the clearings, etc., was full of "white ants," to the exclusion of beetles. *Hymenoptera* were well represented, and I took one or two fine and conspicuous species. Altogether I liked Semao very much as a collecting ground, and was very sorry that we had to leave so soon.

We were off again at daylight on the 17th, and at 9 a.m. sighted Cartier Islet, our first station on the surveying ground, its position being first [illegible] by the wreck of a fine barque lying nearly high and dry on the reef. She appeared to have been there for a long time, but a large part of her stores and fittings remained intact, and were found to be worth appropriating. Cartier is a mere sand bank, less than half-a-mile in length, and destitute of even the smallest trace of vegetation, but it is surrounded by an extensive coral reef, over which I had to walk, through water two feet and more in depth for a mile and a half, and pretty hard work, too, I found it. There was, of course, nothing to do on the Islet except to look for shells, of which I found a good many, and while looking for these I met with a very curious and interesting little Hemipteron (I fancy of the genus *Halobatodes*), inhabiting the sand beneath stones near low water mark, *à la Aëpys.* Turtle seemed to abound on the Islet, judging from the numerous traces observed, and many were seen close to the shore in the evening, but none could be caught.

We left Cartier on the 20th, and made the N. W. Australian coast about Cape Bougainville, about 2 p.m. the next day. The first sight of Australia was not very prepossessing, being (as is the case for several hundred miles east and west of the present point) a low, featureless, red sandstone coast about 200 feet high, of very sterile aspect, densely clothed with dry looking scrub, the innumerable off-lying Islands (very imperfectly indicated in the existing charts) being of exactly the same character. This is our "surveying ground" for the present season, extending from Cape Bougainville (long. 126° E.) to the entrance of King's Sound.

On the 22nd we anchored close to the "Low Rocks" in Admiralty Gulf, in time for me to get a turn on shore. The Island on which I landed was not more than six acres in extent, but I managed to bag five or six species of *Lycænidæ*, one or two of which I have not since met with. The Islet is composed of a very hard white sandstone, and is covered with tall dry grass, almost like a crop of corn. On the 23rd we moved about 25 miles to an unnamed Island in the "Montalivet" group, to which we gave the name of Baudin; this is barely a mile long by half as wide, but of very varied surface, and covered with vegetation and brushwood. I spent the day on shore, from 10.30 a.m. to 6 p.m., but found the walking very fatiguing, as the whole Island is strewn with great blocks of ironstone (of which the Island is in large part composed), which are concealed by the high grass, &c., and the "plague of flies," of which all voyagers to these parts speak in no measured terms, was here in full force; they kept one fully occupied in brushing them out of one's eyes, nose, &c.—fortunately they do not bite! I saw and captured a good variety of butterflies, at least 20 species being observed, the most numerous individually was a black bordered *Pieris*. The fine *Papilio Erithonius* was not rare, but shy and very difficult to obtain (on a subsequent visit to the Island I found the larva pretty freely, and have now a good many pupæ); I also noticed *Euplœa*, *Junonia*, *Terias*, *Lycæna*, *Callidryas*, *Elodina*, &c., most of which I captured, but I could find scarcely any *Coleoptera*. Next day (24th) we proceeded to the westward, among a perfect labyrinth of small sterile islands, for the most part uncharted and unnamed, and in the afternoon came to an anchor off a small rocky Islet, which we called "Queen's Islet," it being apparently unnamed on the chart. Landing here for an hour or two (until I was fairly driven off by the flies!), I found a good deal of grassy and bushy vegetation, and a few *Lepidoptera*, chiefly *Lycænidæ*, but also a nice *Pieris* allied to *P. Teutonia*, *Euplœa Pelor?*, &c. On the following day (25th) five of our officers, including myself, attempted to land on "Bigge Island," but we were met on the beach by a party of eight or ten natives, who showed such decided symptoms of hostility, that we thought it best not to persevere in our attempt (as it was, some spears were thrown at us, none of which fortunately took effect); they were great strapping fellows fully six feet high, perfectly black, and with absolutely no clothing, except a few streaks of white paint on the upper part of their bodies. I have since been informed at Port Darwin that all the natives of the N.W. coast are hostile and untrustworthy, except in the immediate vicinity of the settlements. 26th, we ran down to De Freycinet Island, a very singular little rock, capped with a great mass of ironstone like a huge wall: landed here, but got very little. 27th, again proceeded westward, and anchored off one of the "Heywood Group," where I landed (armed!), but saw little except sand-flies, though there was a fair amount of rough vegetation. 29th, proceeded to the entrance of King's Sound, and anchored among the "Buccaneer Islands" (named I believe by Dampier!); found some natives on the Island where we landed for observations, but they did not come near us, the steam whistle seeming to frighten them very much. I got a few *Lycænidæ* and small moths here, but very little else, these Islands are at this season arid and parched almost beyond belief; it is a mystery to me how the natives manage for fresh water. On the 30th we commenced our return to the eastward, and calling at Queen's Islet and Baudin Island (at which latter place we left a party for tidal observations), we arrived at Port Darwin on the afternoon of June 5th, and I landed for the first time on the mainland of Australia.

We remained here until the 9th, during which time I had some very fair collecting, but as all the species then met with were taken on the second (present) visit, I will not refer to them at present. On the 11th we were again at Baudin Island, where we found the tide party all right, though the natives had paid them a visit, but not, I think, with any hostile intention; they appear to wander from Island to Island on rude rafts or catamarans in search of turtle, &c. We stayed here two days, during which time I got a good many *Lepidoptera*, including the larvæ of *Papilio Erithonius* (which are now producing very fine butterflies), but scarcely a beetle of any sort, though I had laid down traps of dead shell fish, &c. *Coleoptera* are miserably scarce on this coast at the present (dry) season. Having relieved the tide watching party and landed (to make room in the ship) a large quantity of stores and provisions, we left for Port Darwin, where we arrived on the evening of the 15th.

The harbour of Port Darwin is one of the finest in Australia, or indeed in the world, but the shores cannot be called at all picturesque, being low and uniform in character, and covered with a dense growth of mangroves (though the place is very healthy); they gradually rise into a sort of level table land, covered with an open scrub, chiefly composed of stunted bushes of two or three species of *Eucalyptus*, with larger trees of the same kind scattered about; in the gullies there is a more tropical looking growth of bamboos, small fan palms, a large (? Euphorbiaceous) tree, locally known as "milkwood," *Pandani*, *Zamiæ*, &c., but at present the soil is excessively dry, and the herbage and grass, for the most part, burnt up by the sun. The town (Palmerston), which is of some importance as the terminus of the overland telegraph to Adelaide, as well as of the projected overland railway (of which about 160 miles are complete), is built on a bluff overhanging the harbour, and is well laid out and prosperous-looking, although nearly all the houses are built of corrugated iron; the inhabitants number, I should say, about 2500, of whom at least four-fifths are Chinese, who have the largest quarter of the town to themselves. There is very little cultivation, except in some of the gullies, where the Chinamen manage, by industrious irrigation, to keep some market gardens going, and to produce a very fair supply of the usual tropical fruits and vegetables. Natives abound in the bush skirting the town, and very savage looking fellows some of them are, but they are quite safe within a radius of at least thirty miles from here.

My walks have not as yet extended for more than four or five miles from the settlement (some of the very best places for collecting being the lanes leading from the landing place up to the town), but I have managed to accumulate a nice little lot of *Lepidoptera* and *Hymenoptera*; other Orders of insects, except perhaps *Orthoptera*, being just now very poorly represented. As for *Coleoptera*, one may say there are practically none, a day's work producing only a few miserable *Coccinellidæ*, *Galerucidæ*, and the like; a smooth, red *Hispa*? (the larva of which feeds on the *Zamiæ*, and strips the leaves down to the midrib) is the only insect of this Order which can be called at all common. But this is the height of the "dry season" (and dry it is, in all conscience), and during the rains I am told that beetles are only too numerous. One very singular circumstance is that there are apparently no *Coprophaga*; in spite of diligent search in all varieties of their food, I have not taken a single specimen; ants appear to do their work here. In butterflies I have already taken over 40 species, including *Papilio Erithonius* (also larvæ), *Callidryas* (3 spp.), *Terias* (3), *Elodina* (1), *Pieris* (2), *Acræa Andromache*, *Eurycus Cressida* (not rare), *Diadema* (4 spp.), *Danais* (3), *Euplœa* (3 or more), *Junonia* (2), *Cethosia* (? *Penthesilea*, Godt., very common and fine), *Melanitis Leda* (abundant, very fine and variable), *Amblypodia* (lovely sp.), *Thecla*, *Lycæna* (6 spp. at least), *Cœnonympha*, *Satyrus* (2 spp.), *Hesperidæ*, perhaps 5 spp., one of which, a great black and fulvous fellow, three inches in expanse, is the grandest thing of the group I have yet met with. *Diadema Bolina* runs to grand vars. of the ♀, but cannot be called abundant, and I have not found the larva yet, as I did in Tahiti, &c.

There is a good variety of moths (*Pyrales*, perhaps, abounding more than others), including one or two fine day flyers; but the wet season appears to be the time for them, as for the beetles. *Termites* and ants swarm everywhere, and of the latter there is one most objectionable species (? *Œcophylla smaragdina*), a green fellow, about the size of *F. rufa*, which makes large nests by drawing leaves together with a sort of white silk, and is so abundant that eight or ten of these nests may be seen on one bush. These fellows get down one's back while traversing the scrub, and bite most severely, besides emitting a very pungent smell of formic acid; fortunately they do not sting, as some of the species living under stones do. There are "garrapatas" here, but luckily they are not numerous; also (I hear) leeches in some of the marshy places. Dragon-flies are abundant, but none are at all remarkable; some fine locusts, *Mantidæ*, &c., chiefly in the scrub land, and a superabundance of mosquitoes, sand flies, &c., in the mangrove swamps, which (contrary to what I have always heard) produce plenty of butterflies, chiefly *Danais*, *Euplœa*, &c. I get a species of *Halobates* very freely by fishing from the ship's side with a water net. Land shells are few in species and very hard to procure alive at present, though two of the *Helices* are very fine.

There are at least half-a-dozen people here who go in for collecting butterflies, &c., in an amateur sort of way, and I have been able to get a fair amount of information out of them as to the local insects; all agree that this is about the worst time of year, though, judging from what I see in their collections, I find that in my short visit I have obtained very nearly all the butterflies which they have—just under 50 species.

H.M.S. "Penguin," Port Darwin:
June 16*th*, 1890.

[These "notes" are in continuation of those published in Ent. Mo. Mag., Second Ser., vol. i, pp. 284—286.—Eds.]

THE LARVA OF *EUPŒCILIA GEYERIANA*.

BY NELSON M. RICHARDSON, B.A., F.E.S.

Whilst on a visit to the Rev. O. P. Cambridge early in July last, I had the satisfaction of finding the larva of *Eupœcilia Geyeriana* in the seed capsules of *Pedicularis palustris*, thereby confirming the suggestion of Mr. C. G. Barrett made no less than sixteen years and a half ago (Ent. Mo. Mag., xi, 192), and as I have proved its identity by breeding the imago, I append the following description:—

Length of full-fed larva, about 6 lines. Shape decidedly stumpy, the head being only about half the breadth of the middle segments, the width of each segment increasing gradually up to the 5th, after which there is but little alteration of breadth until the 12th, which is narrower, the 13th being still more narrow and about equal in breadth to the 2nd. The transverse section of the body would be nearly circular.

The head is polished, very dark greyish-brown, nearly black, with a reddish tinge about the jaws; plate on 2nd segment like the head, but somewhat mottled with a lighter shade of the same colour, and with a lighter brownish dorsal line. Ground colour of larva a very light greyish-brown (burnt umber with a little black in it produces the right colour), rather darker above the spiracles, especially in the first few segments. The dorsal vessel shows through as a rather darker brown dorsal line. The usual warts are large and conspicuous, though not much raised, those near the head being of the colour of the plate on 2nd segment, whereas the rest become gradually lighter towards the anal plate, which resembles in colour the warts in its neighbourhood. An inconspicuous brownish hair springs from a minute black spot in the centre of each wart; legs dark greyish-brown; edges of spiracles intensely black and solid-looking under a microscope, but hardly visible to the naked eye; hooklets of claspers nearly black, claspers of the neighbouring ground colour.

The shade of the ground colour varies a little in depth in different individuals, but not much.

I have the larva before me in three stages, viz., very small, about half-grown, and full fed. There is very little difference in their appearance, except that the dark parts of the younger larvæ (the head, warts, &c.) are darker, and have a more polished appearance than in the full fed larva, and the space between the head and the plate on 2nd segment is rather whitish, whereas in the full grown larva it is of the ground colour. The younger larvæ are also less stumpy. The egg is doubtless laid in May or June on the bud of the louse-wort, and the newly-hatched larva probably bores at once into the seed capsule, as it is only there that I have found larvæ. It apparently moves from one capsule to another, as I occasionally find a capsule with the seeds partly eaten, and with a hole bored in the outer covering not large enough for the exit of a full grown larva. It is, however, possible that these holes are the work of one of two other larvæ which feed—the first (a Dipterous one) in the stems and capsules, the second a very small (Coleopterous ?) one in the capsules only. If, as Sowerby says of this plant, " no animal will eat it when other food is obtainable," it seems, nevertheless, to be a favourite with insects, as there is also a third small pink (Dipterous ?) larva, which eats the outside of the capsule.

E. Geyeriana, when nearly full fed, sometimes, at all events, feeds upon the capsules from the outside, and eats the case as well as the seeds, as in one instance I found that a larva had eaten about half the capsule itself and was still feeding on the remainder. When touched, it sometimes emits a brownish liquid from its mouth. It is sluggish in its movements, as might be expected from its shape.

The larva leaves the plant to pupate, and spins a rather substantial cocoon of white silk on or just below the surface of the earth. I bred an imago on the 9th of August, and I hear that it was out at Bloxworth on the 1st.

Mr. Cambridge discovered this moth near Bloxworth last year, and kindly showed me the locality, which enabled me to find the larva, though for some time it seemed as if all the eating was the work of the much more numerous non-Lepidopterous larvæ before mentioned, and as if *E. Geyeriana* was still to remain unknown. The plant is a difficult one to keep in a healthy condition, as it soon gets mouldy, and unless the larva is nearly full fed when found, I do not think there would be much chance of rearing it.

It will be seen, on referring to Ent. Mo. Mag., xvii, 36, that the above larva is very distinct from that of *E. udana*.

Monte Video, near Weymouth:
August 13*th*, 1891.

NEW GENERA OF *AGDISTIDÆ* AND *PTEROPHORIDÆ.*

BY THE RIGHT HON. LORD WALSINGHAM, M.A., LL.D., F.R.S., &c.

The following species will shortly be figured with structural drawings in "Novitates Lepidopterologicæ."

(*Continued from page* 218).

STEGANODACTYLA, *gen. nov.*

Type *Steganodactyla concursa*, Wlsm.

Antennæ somewhat stout, simple or slightly pubescent; basal joint elongate, but scarcely enlarged.

Maxillary palpi obsolete.

Labial palpi projecting the length of the head beyond it; second and apical joints approximately equal, apical joint depressed.

Haustellum long, slender, naked.

Head tufted with bifid spatulate scales.

Fore-wings undivided; narrow, elongate, evenly expanding outwards from the base; apical margin deeply indented below the pointed and falcate apex; anal angle nearly square but slightly blunted. *Neuration,* 12 veins; 1 furcate at base; 8 and 9 from a common stem, 8 to apex; rest separate.

Hind-wings undivided; deeply scalloped below the produced apex and again below the middle of the outer margin; with long cilia. *Neuration,* 7 veins; all separate.

Abdomen dilated laterally, fringed at the edges and ornamented above.

Legs, posterior pair with two pairs of long equal spurs, at the base of each spur a fringe of projecting scales.

This genus agrees in the neuration of the hind-wings with *Agdistis* and *Ochirotica*, to which it is nearly allied; it differs in the very distinctly excavate margins of the hind-wings, which, unless we are dealing with a separate and parallel line of development, would appear to indicate a retention of some indication of the lines of fissure represented in the true *Pterophoridæ*, the loss of which has also apparently involved the loss of one of the nervules.

STEGANODACTYLA CONCURSA, *sp. nov.*

Antennæ, palpi, and head, pale ochreous.

Thorax pale ochreous, anterior and posterior margins somewhat flecked with brownish scales.

Fore-wings pale ochreous, costal margin narrowly tinged with brownish-fuscous, interrupted with very pale ochreous spots; beyond the middle a line of scattered brownish-fuscous scales, commencing before the middle, follows the upper edge of the discal cell; a similar line of scales, both much interrupted, is adjacent to the dorsal margin, and extends slightly upwards at the end of the cell, but is continued beyond it to the anal angle; along the apical margin is a distinct brownish-fuscous patch containing from three to five dark ocellated spots; a dark fuscous line running along the base of the cilia from the anal angle to the apex; the cilia, with this exception, are very pale ochreous, with a fuscous patch before the anal angle.

Exp. alar., 16 mm.

Hind-wings pale tawny-brown, cilia the same colour with a pale ochreous line along their base; a fringe of long scales near the abdominal margin runs from the base along the first vein.

Abdomen pale ochreous, a dark fuscous band running down the centre, dilated at the base and posteriorly, it does not reach the penultimate segments.

Legs, posterior pair pale ochreous, banded with brownish-fuscous above the spurs and on the tarsal joints; spurs equal in length and tinged with brown above.

Hab.: CEYLON, Pundaloya, one specimen bred from a larva on *Argyreia* (E. E. Green).

Type, ♂, Mus. Wlsm.

The falcate apex of the fore-wings is clearly defined by a strong line at the base of the cilia, and the deep scallops in the margins of the hind-wings are also clearly shown by a pale line, which follows the outline, between veins 2 and 3 the margin is straightened in contrast with the concave outline above and below it.

I am indebted to Mr. Green for the following notes:—

"The larva feeds between the unexpanded leaves of *Argyreia*. Colour pale dull green tinged with dull purple. A double, short, transverse ridge on each segment ending on each side in a short tubercle, each tipped with a single curved bristle. An interrupted pale subdorsal line, followed by a small black spot on the 5th to 12th segments. A well-defined fringe of soft hairs below the spiracles. The fourth segment is the largest. Legs 16. Length, 5 mm."

STEGANODACTYLA CONNEXIVA, *sp. nov.*

Antennæ whitish.

Palpi whitish; apical joint tinged with chestnut-brown externally; a narrow streak of the same colour on the outer side of the middle joint.

Head white in front, with brown scales behind.

Thorax snow-white, the anterior and posterior margins chestnut-brown.

Fore-wings snow-white along the middle from the base to the apex, costal and dorsal margins chestnut-brown, varied with brownish-fuscous, especially on the outer half of the wing; the brown costal band is dilated outwardly from the base to the end of the cell, where it slightly interrupts the white ground-colour of the wing by meeting the apex of a triangular projection arising from the dorsal band; a similar projection arises from the dorsal band before the middle, but does not quite reach the costal band; the apical margin is narrowly ferruginous-brown, interrupted only at the extreme apex, where it almost joins the costo-apical cilia, which are of the same colour; the white space before the apex is slightly streaked and mottled with brown scales; cilia golden-brown, with a dark ferruginous-brown shade along the basal half, which is interrupted on the dorsal margin. Exp. alar., 17 mm.

Hind-wings tawny-brown ; cilia greyish.

Abdomen flattened and dilated posteriorly with alternate bands of chestnut-brown and snow-white, margined at the sides, except on the penultimate segments, with chestnut-brown projecting fringes ; the apical segment brown, with a whitish band ; the pattern of the abdomen, which is very distinctly marked, may be described as consisting of three white and three brown bands, the white ones of about equal width, the brown ones decreasing in width as they become more remote from the thorax ; the first two of these brown bands are more or less interrupted by white scales at the sides, but not interrupting the brown marginal fringe.

Legs, posterior pair rich ferruginous-brown, with white bands on the tibiæ and on the tarsi, and a conspicuous white spot in the fringe above the second pair of spurs ; spurs brown above, white beneath.

Hab. : Pegu, Thandsung (Karen Hills, 4000 ft., *W. Doherty*).
Type, ♀, Mus. Wlsm.

PTEROPHORIDÆ.

SOCHCHORA, Wkr.

Cat. Lp. Ins., B. M., XXX, 952 (1864).

Type *Sochchora donatella*, Wkr.

Antennæ (♀) setiform, simple, shorter than half the length of the fore-wing.

Maxillary palpi obsolete.

Labial palpi porrect, smooth ; apical joint more slender and somewhat shorter than the second.

Head clothed with bifid scales.

Fore-wings bilobed ; narrow at the base, widened beyond the middle, apical margin oblique and slightly sinuous, anal angle well-defined, apex slightly depressed, falcate in the appearance of the apical cilia ; cleft to less than one-fourth from the middle of the apical margin. *Neuration*, 12 veins ; 8 and 9 from a common stem ; rest separate ; 2 from near angle of cell.

Hind-wings with three lobes ; the upper cleft very short, reaching to about one-third from the apical margin, the lower cleft reaching to three-fourths ; upper lobe rounded and spatulate with a tooth of scales about the anal angle ; the second lobe pointed, ensiform, with a tooth of scales at the anal angle ; the third lobe linear, tufted with a tooth of scales near the apex. *Neuration*, 8 veins ; 5 and 6 short.

Abdomen somewhat dilated.

Hind-legs with two pairs of very long spurs ; with short appressed scale tufts at the joints.

According to Meyrick's tabulation this genus would approach *Platyptilia*, from which it differs very decidedly in the absence of a projecting tuft in front of the head, as well as the slender palpi, and more especially in the very slender linear third lobe of the hind-wings, which is in strong contrast to that of *Platyptilia*, and gives at once the appearance of *Oxyptilus*.

SOCHCHORA DONATELLA, Wkr.

Cat. Lp. Ins. B. M., XXX, 952 (1864).

Walker's description of the species runs as follows :—

> "*Female.*—Gilded ferruginous-red, paler beneath. Fore wings with a few short paler streaks ; an abbreviated transverse black partly cinereous-bordered line beyond the middle ; a more exterior whitish dentate transverse line ; marginal line black ; fringe cinereous ; costa mostly black. Hind-wings blackish, reddish at the base.
>
> *Var.*—Fore-wings dark reddish brown.
>
> Length of the body 4 lines ; of the wings 8 lines."

Hab. : BRAZIL, Ega (*Wkr.*), Petropolis (*Wlsm.*).

My specimen agrees with his dark reddish-brown variety ; he might have added that the posterior portion of the thorax and the base of the abdomen are whitish-ochreous ; the legs are rich ferruginous-brown, the basal portion of each joint slightly paler ; the underside of the body whitish-ochreous, of the wings only slightly paler than the upper-side.

(*To be continued.*)

NOTES ON SOME BRITISH AND EXOTIC *COCCIDÆ* (No. 21).

BY J. W. DOUGLAS, F.E.S.

PLATE II.

LECANIUM LAURI.

(*cf.* Ent. Mo. Mag., xxv, p. 57).

In a former volume (*l. c.*) I described as *L. lauri*, Boisd., flat scales found on bay leaves at Southampton and Lewisham, and although early in the year, yet as there were young larvæ beneath the largest of them, I concluded they were mature. Early in October, 1890, however, on leaves of the same bay tree at Lewisham, and on others sent by Mr. Bignell, of Stonehouse, Devon, besides many young insects, there were several scales of the preceding brood, dead and empty, and these showed there had been a further development, for although not of larger dimensions the median area had become plump, smooth and brown, yet the lines radiating thence to the margins remained and were black, and in all the scales, of every age, the eyes were not black as in *L. hesperidum.* Adverting to Signoret's doubt if *L. lauri* were distinct from *L. hesperidum,* I sent some of these bay leaf scales, and also some of *L. hesperidum* from orange trees, to Mr. R. Newstead, to prepare and mount for examination ; this he has had the kindness to do, and to communicate the result, as follows :—

"The antennæ (fig. 2d) in both kinds do not appreciably differ, but the legs are discordant, as in the comparative statement.

L. HESPERIDUM (fig. 1).	L. LAURI (fig. 2).
Coxa without hairs.	Coxa with two long hairs.
Trochanter with one *very* long hair.	Trochanter with one short hair.
Femur, tibia and tarsus without hairs.	Femur without hairs; tibia with one long hair; tarsus with two very fine short hairs near base of claw.
Tarsal digitules very long, stout at base, dilated at apex, extending beyond dilated digitules of claw.	Tarsal digitules short and stout, scarcely or not extending beyond dilated digitules of claw, which are a trifle longer than in *L. hesperidum.*
Three specimens examined.	Fourteen specimens examined.

"In each kind the characters stated were constant in all the examples."

Some mature scales, on ivy leaves (*Hedera helix*), previously received from Mr. E. Parfitt, of Exeter, proved to be *L. lauri*, all agreeing perfectly with the foregoing description.

Taking all the differential structural characters into consideration, I think there are good grounds for maintaining a specific distinction, and I apprehend that hitherto two similar species have often been regarded as one. *L. hesperidum* has not been recorded as found living on plants growing in the open air in England.*

ORTHEZIA OCCIDENTALIS, *n. sp.*

♀ adult (Fig. 3). Short-oval, piceous, covered with white cereous matter, forming above the head an obtuse, gibbous, projection, and thence, on the margin all round, as a raised border, a series of broad, upward-curving, laterally-joined lamellæ, slightly longer posteriorly, meeting there in a broader, channelled, projecting plate; marsupium (in this example) only incipient. On the uneven dorsal surface (within the marginal border), lying in a depression in the middle of each of the three thoracic segments, a scutelloid, obtusely pointed, concave, wedge-shaped plate extends backwards on to the next segment, interrupting, as it were, the lamellæ which extend from side to side; their lower edge is not straight, but next to the cuneate plate on each side of it is curved up to it, and its raised surface there is hollowed out or flattened. On the other segments the lamellæ are of similar form but shorter (narrower), and are interrupted in the middle by a continuous longitudinal, angular furrow, of which the sides are raised into obtuse points on each segment. Legs, and antennæ of 8 joints (Fig. 3a), piceous. Length (without marsupium), 4 mm.

♂ larva (or what I deem to be such) like the adult ♀, except in size, but the three thoracic cuneiform plates and the points on the edges of the abdominal furrow are all more sharply defined, and the terminal projecting lamella of the circumferential series is conical. Length, 2·5 mm.

Male imago not seen.

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* On July 1st, 1891, Mr. S. Stevens sent from his conservatory some leaves of *Nerium oleander* crowded on the under-side along the mid-rib with scales of *L. lauri* in all stages of growth. Examination showed the antennæ and legs to be identical with the figures quoted above, except that in the adults, in some cases, the 3rd and 4th joints of the antennæ are equal in length.

On June 17th, 1889, I received from the Colorado Biological Association three specimens of the species described above, one of them a female with marsupial ovisac undeveloped, and two but little more than half as large; with the following note from Mr. T. D. A. Cockerell:—

"Enclosed is a species of *Orthezia* for your kind determination. It occurs here (West Cliff, Custer Co., Colorado, altitude about 7700 feet above sea level) in nests of an ant, *Myrmica?*, and appears to be new. I submitted specimens to the Department of Agriculture, and Mr. L. O. Howard writes—'Your Coccid from an ants' nest is an *Orthezia* which may be undescribed. It seems to differ in some respects from *O. americana*, Walker, but there are so many described species of this genus which we have not in the Museum that I hesitate to say it is new.'"

On July 25th, in reply to my enquiry, Mr. Cockerell wrote:—

"I have not been able to find any more of the *Orthezia*. Certainly they were in the ants' nest, and I cannot conjecture whether the ants took them in or they were there of their own accord, but the latter seemed probable. What they feed on I have no idea. There were many willows near where I found them, and much herbage. Might they feed on the roots of some plant?"

No species of *Orthezia* is known to feed on *roots* of plants. The association with ants is curious and deserves investigation; and it is desirable that the species of ant should be identified: the specimen sent could not be recognised here.

The description by Walker of his *Dorthesia americana* (List of Homopt. Ins. in Brit. Mus., iv, p. 191, 1852) is not sufficiently definite to determine any species; and the figure of what purports to be that species given by Comstock in his Report for 1880, pl. ix, fig. 3, certainly does not represent the form now before me, nor do I know of any description that will apply to it. The only other species that has a scutelloid formation on each of the thoracic segments is *O. cataphracta*, Shaw, but there they are very minute and rounded (*cf.* Trans. Ent. Soc. Lond., 1881, pl. xv, figs. 8, 10). The name is suggested by Mr. Cockerell with reference to the western origin of the species.

[NOTE.—In fig. 3 the shading is much too deep, obscuring the raised points on the abdomen.—R. N.].

ORTHEZIA PRÆLONGA, *n. sp.*

♀ adult (Fig. 4; profile 4a). Long and narrow; pitchy-black, covered with snow-white cereous laminations. Antennæ long, slender, ochreous, base and apex piceous. Legs slender, ochreous. Two large, thick, laterally conjoined lamellæ project over the head; the upper surface of the body throughout covered with thick cereous matter, formed of conglomerate lamellæ, the rounded ends of which do not quite reach the sides of the body, but terminate abruptly and leave the ground colour narrowly visible within the lateral margins; the middle of this mass is traversed lengthwise by a deep furrow; on the outer sides of the body are narrow laminæ extending downwards, and continued in consecutively lengthening series round to the anal region, so that they project greatly and lie in the channels of the marsupium; marsupium much shorter above than beneath; of the raised lines between the channels the two outer have their posterior ends curved round towards each other; the lower surface curved upwards, the end especially more turned up suddenly, so that it is at a much greater elevation than any other part of the surface, and between it and the end of the upper-side is a large open cavity; the outer sides of the marsupium finely channelled longitudinally, the under-surface smooth. Antennæ of 8 joints (Fig. 4b).

Length of body, 2, with marsupium, 4·5; breadth, 2 mm.

Male unknown.

Very distinct by the narrow and elongate form, the latter characteristic due to the marsupium, and by the peculiar character of the lamellation. Having been sent in cotton wool saturated with spirit, almost all the specimens have been deteriorated by partial removal of the lamellæ, but the description has been made from several individuals.

Kindly forwarded on May 23rd, 1889, by Mr. D. Morris, of the Royal Gardens, Kew, who received them from the Botanic Garden at Trinidad, where they were found on the leaves of a *Capsicum*.

In October, 1890, I received from Mr. Jenman, the Superintendent of the Botanic Gardens, George Town, Demerara, through Mr. S. J. McIntire, several specimens of this species on leaves of *Sauchezia nobilis*, but they were all dry and broken to pieces. Still I could recognise the characters, and this is of interest in showing that the insect inhabits more than one locality.

EXPLANATION OF PLATE II.

See p. 166 *ante*; and add thereto *Lecanium lauri*:—2d, antenna.

153, Lewisham Road, S.E.:
November, 1890.

ON TWO SPECIES OF *ELACATIS* (*OTHNIUS*) FOUND IN JAPAN.

BY G. LEWIS, F.L.S.

The first time I saw a species of *Elacatis* alive was at Singapore in 1872; at that time a large number of specimens were running very actively over the dead branches of some small trees in the public garden. In 1880 and 1881 I met with *Elacatis Kraatzi*, Reitter, continually in Japan under similar circumstances, on posts and railings when bark remained on them and the timber was not old.

These insects conduct themselves very much like the small

Cleridæ, they are diurnal, and in Japan they display the greatest activity in sunny warm days of May and June; but in the tropics I imagine they are on the alert whenever the weather is fine, but not in the extreme heat of noon. They are not always easy to catch, as they drop and fly when disturbed.

ELACATIS KRAATZI, Reitter, Deutsche Ent. Zeit., 1879, p. 226.

This species varies very much in size, my largest ♂ measures 6½ mm., and the smallest ♀ 3½ mm. I took very few males in comparison with the number of females, and the males have two curious foveæ in the middle of the mentum, each fovea having a tuft of protruding griseous hairs. Dr. Horn first published a notice of this sexual character, and figured it in the Trans. Am. Ent. Soc., 1888, p. 28, t. 3, fig. 24 b, after having seen it in an American species. In *E. Kraatzi* it is very conspicuous, and as Reitter has not seen it, I think he only knew the female. The female has only two shallow impressions in the menton.

Hab.: Found in all the Japanese islands in forests away from the coast.

Reitter described this species from a Siberian specimen, and a type from Herr Reitter kindly sent to me agrees exactly with my ♀ specimens.

I also found the following in South Japan.

ELACATIS OCULARIS, *n. sp.*

Angustata, subparallela, nigra, griseo-pubescens, punctata, sat nitida; antennis nigris, geniculis tarsisque ferrugineis; fronte inæquali, oculis prominentibus; thorace undique subocellato-punctato, utrinque 4-denticulato; elytris punctatis maculis plurimis irroratis luteis. *Long.*, 3½—4 *mm.*

Narrow, rather parallel, black, clothed with griseous pubescence; antennæ black, in two examples piceous, but in all concolorous, 1st robust, 2nd similar in shape but smaller, 3rd longer and less stout, 4th to 8th moniliform, 9th and 10th transverse and anteriorly truncate, 11th circular in outline, the last three form a loose club; head rather rugosely and thickly punctate, and with the thorax slightly æneous, the eyes are very prominent, and the surface between them uneven; thorax, anterior angles are rounded off, and the lateral edges have four denticulations, the basal tooth largest; elytra punctate, punctures somewhat shallow and rugose, black variegated with luteous patches, the region of the scutellum being usually dark. The head beneath has, in common with other species of the genus, a wide, smooth space bordered by an area of large punctures. There are no foveæ in the mentum in the male.

This species is similar to *E. lyncea*, Pascoe, a species I found not uncommonly in Ceylon.

Hab.: Kiushiu. I took eight examples in the forests on the banks of the Kumagawa in Hiogo in May, 1881.

Folkestone: *July*, 1891.

Notes on the food-plants of Thecla rubi.—The ova were laid freely in captivity on sprays of gorse (*Ulex europæus*), the females being confined with these in a glass jar, placed in the sunshine.

Although the young larvæ began at once eating the young undeveloped shoots of the gorse, this was found to be unsatisfactory as a food-plant; partly owing to the ease with which they concealed themselves amongst it, rendering the changing of food a tedious business. Broom not being handy, I tried *Lotus corniculatus* and *Lotus major*, with great success, the larvæ growing rapidly upon these plants, the leaves being occasionally eaten, but the flowers vastly preferred.

As I have frequently seen birch mentioned as a food-plant for *Thecla rubi*, I may remark that I could never persuade my larvæ to touch it, and Mr. Harwood, of Colchester, informs me that his experience has been the same. I found that the larvæ would also eat various kinds of clover, but did not find these as convenient food-plants as the species of *Lotus* referred to. When full-fed, some of the larvæ pupated upon the earth provided (but never beneath it), others on the sides or corners of the cage, spinning a few threads, in no definite direction, but just enough to hold the pupa in the spot selected, from which it is easily dislodged. The ova were laid on the 10th of June, larvæ hatched 18th of June, and were full-fed about July 14th.—R. M. Prideaux, 9, Vyvyan Terrace, Clifton, Bristol: *August 6th*, 1891.

Stenophylax alpestris in Yorkshire.—In a small box of insects of various Orders, which Mr. John Harrison, of Barnsley, gave me on July 18th last, I found two specimens of *Stenophylax alpestris*. As was the case with the three specimens taken by Mr. Chappell (see Ent. Mo. Mag., iv, p. 205), Mr. Harrison unfortunately does not know exactly where he took them, but says it must have been at no great distance from Barnsley, and probably at Dunford Bridge, which is some ten miles from Barnsley, and about the same distance from Huddersfield.—Geo. T. Porritt, Huddersfield: *July 31st*, 1891.

[I received four specimens from Mr. Chappell in two instalments in 1868; the first was distinctly indicated as from "Burnt Wood, Staffordshire," the others from "Staffordshire" only.—R. McLachlan.]

Nothochrysa capitata near Weymouth.—I have pleasure in recording the occurrence in this neighbourhood of *Hemerobius concinnus* on August 8th, 1889, and *Nothochrysa capitata* on June 29th, 1891. I took a single specimen of each species in a wood composed of various kinds of firs, a few oaks, &c., near here. The latter specimen was, I think, beaten out of a spruce or flying near it, and presented a most remarkable appearance when flying. I could not make out at all what sort of insect was before me—the effect of the reddish body and the *Chrysopa*-like wings was very curious. I have to thank Mr. C. W. Dale for kindly naming these specimens.—Nelson M. Richardson, Monte Video, near Weymouth: *August 13th*, 1891.

Dufourea vulgaris, Schk., at Chobham, Surrey.—On the 1st of August, 1881, Mr. T. R. Billups captured the ♀ of this rare bee at Woking on a flower of ragwort. *On the 1st of August*, 1891, I took a ♂ on a dandelion flower at Chobham. As I have repeatedly looked for this insect about here without success, I think it may be fairly concluded that it is a great rarity. It is so like a small black *Halictus* that

I have been constantly afraid of passing it over, but the different style of flight of the specimen I have just caught told me at once that I had got something unusual, and distinct from an *Halictus*. I hope more specimens may be found before the 1st of August, 1901.—EDWARD SAUNDERS, St. Ann's, Woking: *August 13th*, 1891.

Various Captures in June and July.—Although the season has not been altogether favourable, still I have met with a few rarities, the best being a couple of *Scybalicus oblongiusculus* at Lulworth, and three of *Platymetopius undatus* at Hook (fresh localities for both species); I have also taken *Allantus hæmatopus, Calobata ephippium*, and *Platycheirus immarginatus* at Abbottsbury, *Beris Morrisii* at Hook, *Eupæcilia pallidana, Pelecocera tricincta*, and *Cryptocephalus lineola* at Bournemouth, *Crambus selasellus, Butalis siccella, Leucopis puncticornis, Harpalus melancholicus*, and *H. vernalis* on the Chesil Beach, *Nephrotoma coxalis, Tipula vittata*, and *Pompilus hyalinatus*, var. black abdomen with red band, at Glanvilles Wootton.—C. W. DALE, Glanvilles Wootton: *August 12th*, 1891.

Microdon mutabilis, Lin.—Mr. Bignell, in recording the capture of this species in Ent. Mo. Mag. for August, writes—"Mr. Verrall had placed it in his list in italics as much as to say it was a doubtful British species." Now it was figured as a British species by Curtis in his British Entomology as long ago as 1825; in it he says—"I had the pleasure of seeing Mr. Dale beat one out of an oak in the beginning of June near Lyndhurst, and he informs me that he has taken three off grass and birch on the borders of Dorsetshire." I have taken it myself at Glanvilles Wootton in 1869 and 1889. Now Mr. Verrall inserts both *mutabilis* and *devius*, L., in italics. Our species is most probably *devius* and not *mutabilis*.—ID.

Review.

FURTHER COCCID NOTES: WITH DESCRIPTIONS OF NEW SPECIES FROM NEW ZEALAND, AUSTRALIA, AND FIJI; by W. M. MASKELL, F.R.M.S.; pp. 1—36, 7 plates, 8vo. Wellington, N. Z. (Extract from the Transactions of the New Zealand Institute, 1890.)

Attention is being more and more directed to the *Coccidæ*, which, as regards form, metamorphosis, and economy, are among the most wonderful of insects, and besides the interest they, for these reasons, have for entomologists, the vast injuries they often cause to plants and fruits are compelling cultivators all the world over to study them, if only for the purpose of discovering the best means of destroying them. In the present paper, which is supplementary to his former excellent works, Mr. Maskell describes and characteristically figures many new species of the extraordinary genera peculiar to the Southern Hemisphere, and gives general and special critical remarks on *Coccidæ*, which are of great value to students, as, for instance, where he says, with regard to the anomalous *Cœlostoma assimile*, "Whatever be the rule amongst other orders and families of insects, Coccids present this difficulty to students, that one must be prepared at any time to find very distinct departures from generic, or even group, types, and to consider any character whatsoever as elastic and variable."

Obituary.

Ferdinand Grut, F.L.S.—We briefly announced the death of Mr. Grut in our last No. (p. 227). He was born at St. Peter's Port, Guernsey (where his family had been settled for more than 400 years), on January 19th, 1820. His parents left Guernsey in 1825, with their children, of whom Ferdinand was the fifth, and settled in London. He was educated at Edinburgh Academy and University, and afterwards was clerk under his father (Nicholas Grut), who was then Secretary to the "Palladium" Insurance Office. He subsequently, in 1852, became Secretary to "Marshall's Charity," a wealthy institution, having for its object the augmentation of the stipends of small Church livings, which position he held until his death. In October, 1866, he married Mary Eliza, daughter of the Rev. John Bowstead, but had no family. His widow and two sisters remain to deplore his loss: we believe the male line of the family is now extinct.

For several years Mr. Grut had suffered from *angina pectoris*, which became more distressing latterly, and caused his very sudden death on the evening of July 19th, at 9, Newcomen Street (formerly King Street), Southwark, the offices of "Marshall's Charity," where he resided. It can be said of no man that he died more truly in harness, for he attended to his varied official duties to the very last. He was buried in the family grave at Sevenoaks.

Mr. Grut's connection with the Entomological Society of London was long, useful, and laborious. He was elected in 1846, and there now remain only ten Fellows of older date. In 1856 he was on the Council, and was Vice-President in 1863, and again on the Council in 1868, a position he held to the last, an uninterrupted stretch of 23 years. He was one of the Secretaries from 1871 to 1877, and Honorary Librarian from 1878 to 1891, during a long portion of which period he was single-handed, for it was only latterly that a resident Librarian was appointed. Not the least arduous part of his labours was the compilation of the huge MS. Catalogue of the Library, familiar to most of the Fellows. His work was truly a labour of love, in which he took the keenest interest, and his constant regret latterly was that his failing health sometimes did not permit him to perform his duties to his own satisfaction; to his colleagues nothing was apparent save an occasional weakness of memory.

Mr. Grut was also for many years Secretary to the Entomological Club (not connected with the Society), and we think it was mainly owing to his exertions that the Club continues to exist. Many will remember those pleasant annual excursions organized by him; many also had the privilege of attending the meetings of the Club at his house in Newcomen Street, which *réunions* were always of the most enjoyable nature, with Mrs. Grut, and usually his unmarried sister, dispensing tea and coffee in a lower room to the guests as they arrived.

In 1872 he was elected into the Linnean Society, and was a nearly constant attendant at the meetings. Also for many years he was on the Council of the Ray Society, and from his ready discrimination and business habits, was of great service at the not too frequent meetings.

Mr. Grut amassed an extensive library, both entomological and general, which includes many valuable works. He also formed a large collection of *Coleoptera*, chiefly *Carabidæ*, but added little to it latterly, yet, owing to the period at which it was principally brought together, it must be of value. As an author we think he published only a few short notes; nevertheless, owing to his long-continued official duties, there are few men in this country who have done more to sustain entomological science. A man has gone from among us whose place it will be difficult to fill in all its varied aspects. As a friend he will be extensively mourned. Strictly upright and honourable in all his actions, thoroughly genial and cordial in social intercourse. A staunch Tory and Churchman, he never allowed political differences of opinion or religious views to influence him in his friendships, and it would be difficult to find one with whom it was more pleasant to work as a colleague, a fact to which the writer of this notice, a co-Secretary with him of the Entomological Society for several years, readily testifies. Few men could have been less spared.—R. McL.

Societies.

Birmingham Entomological Society: *July 20th*, 1891.—Mr. R. C. Bradley in the Chair.

Mr. G. H. Verrall, F.E.S., was present, and delivered a lecture on *Diptera.* He said he had come down with the hope of inducing Members to take up the study of the Order, which possesses many recommendations not possessed by other Orders of insects. It is a much neglected Order, and therefore shows a considerable field for original work to all; all workers can introduce new species, &c., he had introduced some hundreds to the British List. Another recommendation to the group is that it is not necessary to go far for fresh material to work at, one's own garden providing much; he had taken in his garden at Newmarket 500 species. He briefly described the classification and characters of the Order, and then ran in review the families and genera, giving their salient points and many interesting facts about them. Mr. C. J. Wainwright proposed a vote of thanks, which was seconded by Mr. G. H. Kenrick, supported by Dr. P. B. Mason, and replied to by Mr. Verrall.—Colbran J. Wainwright, *Hon. Sec.*

Entomological Society of London: *August 5th*, 1891. — Frederick Du Cane Godman, Esq., M.A., F.R.S., President, in the Chair.

Mr. Arthur J. Chitty, of 33, Queen's Gate Gardens, S.W., and Captain E. G. Watson, of 5, Lypiatt Terrace, Cheltenham, were elected Fellows of the Society.

The President announced the death of Mr. Ferdinand Grut, the Hon. Librarian of the Society, and commented on the valuable services which the deceased gentleman had rendered the Society for many years past.

Dr. D. Sharp exhibited *Japyx solifugus*, from the Eastern Pyrenees, and stated that in his opinion it was a connecting link between the *Thysanura* and *Dermaptera.* He also exhibited pupæ of *Dytiscus marginalis*; one of these was perfectly developed, with the exception that it retained the larval head; this was owing to the larva having received a slight injury to the head. Dr. Sharp also exhibited specimens of *Ophonus puncticollis* and allied species, and said that Thomson's characters of the three Swedish species, *O. puncticollis*, *O. brevicollis*, and *O. rectangulus*, applied well to our British examples, and separated them in a satisfactory manner. Thomson's nomenclature, however, would he thought prove untenable, as the distinguished Swede described our common *puncticollis* as a new species under the name of *rectangulus*.

Mr. F. W. Frohawk exhibited a bleached specimen of *Epinephele Janira*, having the white fore-wing of a creamy-white, blending into pale smoky-brown at the base; also a long and varied series of *Epinephele Hyperanthus*, from the New Forest and Dorking. The specimens from the former locality were considerably darker and more strongly marked than those from the chalk. Amongst the specimens was a variety of the female with large lanceolate markings on the under-side, taken in the New Forest in July, 1890, and a female from Dorking with large, clearly defined, white-pupilled spots on the upper-side. Mr. Frohawk further exhibited drawings of varieties of the pupæ of *E. Hyperanthus*, and also a large specimen of a variety of the female of *Euchloë cardamines*, bred from ova obtained in South Cork, with the hind-wings of an ochreous-yellow colour. Coloured drawings illustrating the life-history of the specimen in all its stages were also exhibited.

Mons. Sergé Alphéraky communicated a paper entitled, "On some cases of Dimorphism among Palæarctic *Lepidoptera*."—H. Goss, *Hon. Sec.*

ON OVIPOSITION, AND THE OVIPOSITOR, IN CERTAIN *LEPIDOPTERA*.

BY JOHN H. WOOD, M.B.

(*concluded from page* 215).

There still remain the pocket-makers, *Micropteryx* and *Incurvaria*. They, or I should rather say *Micropteryx* (for I have not examined *Incurvaria*), is so exceptional in many ways that it requires a separate notice. The abdominal wall shows the same solidity of structure as in those we have just been considering, but the 7th segment is not extra large, nor are its component plates of disproportionate length. Perhaps the greatest anomalies are connected with the sheath (Fig. 12, S (sh.)). In all insects we have hitherto met this structure is rigid, but here it is a flexible tube that is rolled up* within the abdomen when the ovipositor is withdrawn. Probably this peculiarity is to enable the sheath more easily to enter and adapt itself to the pocket, for it is self-evident that a soft expansile tube must be better fitted for the purpose than a hard and unyielding one. Yet the sheath is not altogether devoid of chitine, for a considerable part of its surface

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* Correctly speaking, it is invaginated rather than rolled up. The sheath is attached to the ovipositor at the level of a line passing round just behind the points of the lower spurs, and at the inner end is tied up short to the tip of the 7th ventral plate, and more loosely to that of the dorsal plate. In the diagram, therefore, the sheath is shown not fully extended, the outer end being still invaginated.

has little scales of this material disposed in lines, which radiate from the middle line of the dorsum and pass diagonally downwards. Four or five of these lines, where they meet over the back of the structure at its inner end, are converted into rows of tiny teeth, pointing back towards the abdomen. I imagine that their use is to catch hold of the wall of the pocket, and prevent the root of the sheath from slipping out, when the rest of the apparatus is withdrawn, which, as we shall see presently, happens several times during the operation of cutting the pocket. In consequence of the flexibility of the sheath, the protrudor muscles of the ovipositor, which we have so far always found to spring from the segment immediately above, namely, the 8th or its equivalent the sheath, have here to be moved up to the 7th segment, from the dorsal plate of which at its outer end they take their rise. But a still more remarkable result is the dislocation of the outer rods (Fig. 12) and their transference to the ventral plate of the 7th segment. They could exercise little or no control over so yielding a body as the sheath, whereas, by their insertion into the ventral plate of the 7th segment, they are able, as has already been shown (*ante*, vol. i, p. 150), in the first place to open the outlet, and next to advance the point of the plate into the mouth of the leaf-pocket, and keep it on the stretch, so as to prevent the nipping of the sheath, and of the tender under-parts of the ovipositor, which would else occur.

The anomalies of the ovipositor are almost as remarkable, and certainly more difficult to understand. The skeletal portion consists mainly of a very strong horizontal plate, flat, except for a rather sharp upward curve at the extremity, and armed with saw-like teeth round its lancet-shaped end (Fig. 10); its length, as compared with that of its rods being as nearly as possible 1 to 3. (As the details are not quite alike in all the species, I ought to say that the particular one here described is *semipurpurella*.) I originally called this plate the knife-blade, but it would be more correct to liken it to a pair of knives (sub-plates), lying back to back, and united to each other near the points. The backs of the knives are directly continuous with the rods, and are of some considerable thickness up to some little distance from the extremity, when they get spread out and united with each other, leaving only a thread or two of thicker material to run on into the tip. The blades, which commence abruptly, are narrow plates of a peculiar fibrous structure, looking

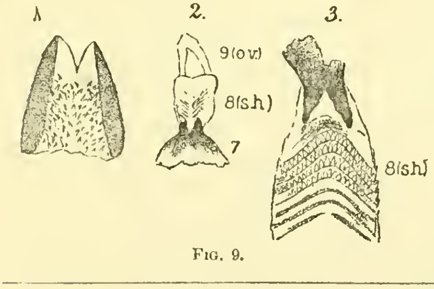

Fig. 9.

Fig. 9.—1, The two halves of ventral plate of ovipositor, with the connecting membrane studded with teeth. 2, dorsal view of the end segments, showing the shape of knife-plate at work. 3, Inner end of sheath with rows of teeth, and the bifid tip of 7th dorsal plate.

much like whalebone, with the fibres at right angles to the long axis of the knife. The whalebone tissue is not continued quite to the end, but terminates just where the plate gets rounded off to form the lancet-like head, its place here being taken by ordinary homogeneous chitine. So far there is nothing to distinguish it fundamentally from the ovipositor of *A. viridella*, but if we turn it over and examine the under-side, a most unexpected and puzzling state of things presents itself, for we find attached there a pair of supplementary knives, the counterparts of the main ones. They lie, however, so directly under the latter, and match them so exactly, that they are apt at first to be overlooked, whilst the structures that do catch the eye are a pair of black chitinous spurs on either side, united by a common fibrous attachment to the under-side of their respective rods at the junction of these with the sub-plates. I will deal with these spurs first. Each pair lies in the same vertical plane as its rod, but its component parts face in opposite directions. The inner and shorter spur (Fig. 11, e) looks towards the abdomen, and receives numerous muscular fibres that come from some point within the body. The precise spot I have not been able to ascertain*—a matter of not so much consequence, since there can be no question that the muscle is a retractor, and in conjunction with the one on the opposite side withdraws the knife within the body, and is, therefore, the retractor of the ovipositor. The outer spur (Fig. 11, d) is longer, and faces outwards. Its point is dark and chitinous, but its body is hyaline and apparently fibrous, indicating that it is more pliant and mobile than the inner spur. Among my earlier notes is one assigning a muscle to the point of this spur also, but as I have no preparation by me that actually shows it, it may be that in those early dissections membrane was mistaken for muscle, an error that might easily have happened. Yet after all I believe that the observation was right, because the mechanism of the parts, as I understand it, requires that such a muscle should exist.† But of this presently.

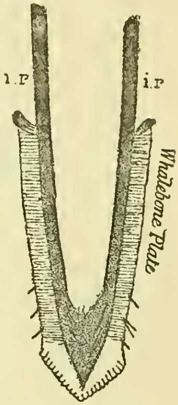

Fig. 10.

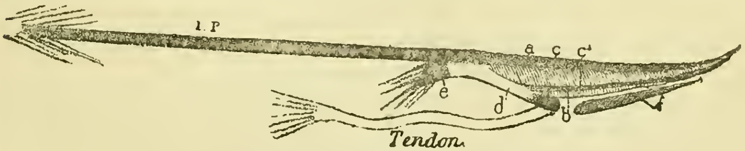

Fig. 11.

Now, from the outer spurs, midway between their point and base, there comes

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Fig. 10.—Upper surface of knife-plate, with parts of the inner rods attached to it.

Fig. 11.—Side view of one-half of knife-plate, and its rod. a, Back of main knife. b, Back of supplementary knife. e, c′, Whalebone plates of main and supplementary knives. d, Lower spur. e, Upper spur, with torn fibres of retractor muscle attached to it. f, Ventral sub-plate of ovipositor.

* This point has since been cleared up, and the muscle found to arise from the point of the outer rod.

† I have now ascertained that these muscles do exist. The arise, like the retractors of the ovipositor, from the points of the outer rods, and end in extraordinarily long tendons, which are inserted into the points of the outer spurs. The presence of the tendons is most unusual, and I know no other instance of their occurrence. The consequent curtailment in length of the contractile parts indicates that the muscles act within comparatively narrow limits—a circumstance still further confirmatory of the view, given later on, of the mechanism of the parts.

off a pair of chitinous rods (Fig. 11, b), which at the other end run into, and are amalgamated with, the tip of the knife plate. These rods are the backs of the supplementary knives. They possess blades (Fig. 11, e′), which are fibrous, like the blades of the main knives. Each supplementary blade is united by its edge to the same part of the corresponding main blade, their union giving rise to a thick solid rim, which runs all round the knife plate, and out of the under-side of which at the lancet-like end the saw is cut.

Following the rule in cutting instruments, the visceral tube does not reach to the end of the knife-plate, but leaves the cutting point free. A pair of rather large lanceolate plates (Fig. 11 f) are imbedded in the wall of its lower side, the points of which project a little beyond the mouth of the tube. I have little doubt that they are the two halves of the ventral plate of the ovipositor (9th segment), but quite dislocated from the rods, and having no connection with them. When the tube is collapsed, the plates lay side by side, but when distended, they become widely separated, and bring into view on the intervening membrane numbers of rather large recurved teeth (Fig. 9, 1), which, by seizing hold of the wall of the pocket during the birth of the egg, must, I imagine, greatly facilitate that process. The tactile hairs are confined to the 7th or last abdominal segment, with the exception of a few short and very stiff ones that are placed at pretty regular intervals along the edge of the knife plate. In *semipurpurella* and *unimaculella* there are three of these hairs on each side, but in *purpurella*, which has a proportionately shorter instrument, there are but two.

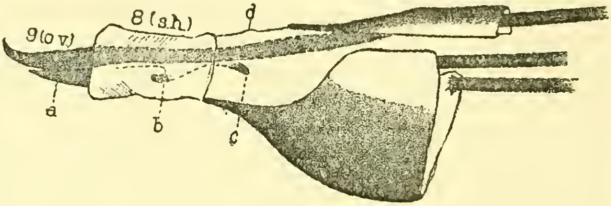

FIG. 12.

At the commencement of these articles I alluded to the difficulty usually attending the demonstration of the retractor muscles in the rigid, long-rodded instruments. In *Micropteryx* it is otherwise. I have already pointed out the retractors of the ovipositor and their insertion into the inner spurs at the base of the rods; but it is to an instructive preparation of Dr. Chapman's that I am indebted for the demonstration of the retractor muscles connected with the outer rods. They appear in the preparation as broken fibres attached to the tips of these rods, and passing up into the abdomen; running in an opposite direction to the protrudors, their office must be to draw back the 7th ventral plate out of the mouth of the leaf-pocket, into which it had been advanced by the protrudors, and to close the abdominal outlet.

I will now give what I take to be the meaning of this singular and complicated implement. But first let me draw attention to the curve at the end of the knife plate, a shape scarcely fitting it, it seems, either for scratching through the cuticle at starting, since the point would be turned away from the surface of the leaf, or for

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FIG. 12.—Side view of last three segments; 9 and 8 considerably but not fully extended. a, Ventral sub-plate of ovipositor. b, Lower spur. c, Upper spur. d, Inter-segmental membrane.

afterwards cutting the pocket without the constant risk of the point coming through the wall. How the disqualification is overcome I hope to be able to show.

Having kept a *semipurpurella* in confinement, I had the advantage on several occasions of watching her method of proceeding. As the plates of the last (7th) abdominal segment gradually opened, and the ventral one was at the same time extended and advanced within the lip of the pocket, it was easy to see, through the transparent membrane filling the gap between them, the spurs of one side gliding up and down, the lower spur appearing more erect than in the quiescent state, and standing nearly at right angles to the line of the instrument. As the depth of the pocket increased, the spurs passed out of sight, but would presently flash by again, followed by a brown body—the knife and its rolled up sheath, and would disappear within the abdomen. Again would the instrument be shot down into the pocket, where it would remain for some seconds, and then once more flash into sight and disappear as before; and this would be repeated several times before it was finally withdrawn, slowly and cautiously, as compared with the former rapidity, so as not to scratch nor injure in its passage the thin-shelled and delicate egg. But if, instead of this side view, we take a full view and look through the upper surface of the leaf, we shall see that the saw does not make rapid alternating cuts from side to side, but that it works away for a time at one wall, and is then withdrawn for an instant, and on starting again begins on the other wall, and that it is in a sort of piece by piece fashion that the pocket is cut. At the same time a singular feature is noticed, which is, that the knife plate loses in symmetry, bulging out on the one side, viz., that on which it is working, and becoming slightly concave on the other side. It might be thought that this is merely the effect of the resistance it meets with, just as a stick bends when it is pressed against an object, but this can scarcely be the true explanation, since the same shape is sometimes seen in specimens under the microscope (Fig. 9, 2), where no such resistance can be present, and we are, therefore, forced to the conclusion that the power to alter its form, unlikely as it may at first sight appear, must be inherent in the instrument itself.

Now, I wish to draw particular attention to one point, not apparently a very large one, in the above observations, namely, the erect position of the lower spurs, as compared with their supine state when at rest. It is most important. In the first place, it must be effected by muscular agency, and by just such muscles, too, as I have shown some good reason for believing* are actually inserted into the points of these spurs. In the second place, the raising of the spurs to an erect position draws back the supplementary knives attached to them by means of the rods ("backs"), whilst at the same time the main knives are being thrust forwards by the great protrudor muscles, and the effect of these two opposing forces upon the tip of the instrument will be to remove its upward curve and straighten it. Yet this is not quite the whole matter. The instrument is practically double, one side remaining idle, whilst the other is sawing away at the leaf, and if we suppose that, instead of the opposition being between the parts of the same side, it is between those of opposite sides, that is, that when the main knife of one side is pressed forwards, the supplementary knife of the other side is pulled back, then not only is the point quite as effectively straightened, but also at the same time the instrument is given the bow-like figure it puts on at work.

It may be objected that the movement of the knives upon each other, which must take place before the point can be straightened, is rendered impossible by the union between the whalebone blades; but it must be remembered that the required movement need only be very small, that the blades are only united along the edge, and that their peculiar fibrous nature not only favours, but has probably been designed to allow of, a slight gliding motion upon each other, and at the same time provides by a natural recoil for the resumption of the curve, directly the muscular action ceases. But it may be asked, why is the point of the knife curved at all? I believe it is that the egg may escape injury or displacement from the saw coming in contact with it, whilst the instrument is being withdrawn; either of which accidents would, it seems to me, be liable to happen in so cramped a space as the leaf-pocket, were the end of the instrument flat. Such are the facts connected with this complex organ, and the conclusions that have been drawn from them. That they have in every particular been rightly observed and interpreted is, perhaps, scarcely to be expected, yet I think that in the main they will be found to be correct.

Tarrington, Ledbury:
November 17*th*, 1890.

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* The existence of these muscles is no longer doubtful, as has been pointed out in a previous note.

NEW GENERA OF *AGDISTIDÆ* AND *PTEROPHORIDÆ*.

BY THE RIGHT HON. LORD WALSINGHAM, M.A., LL.D., F.R.S., &c.

The following species will shortly be figured with structural drawings in "Novitates Lepidopterologicæ."

(*Concluded from page* 244).

GILBERTIA, *gen. nov.*

Type *Gilbertia eques*, Wlsm.

Antennæ (♀) simple.

Maxillary palpi obsolete.

Labial palpi, second joint somewhat thickened; apical joint shorter than the second, recurved, slender.

Head tufted above with bifid scales.

Fore-wings narrow, cleft to two-fifths of the wing-length; upper lobe slender; second lobe wider and distinctly falcate, with an excavate outer margin; anal angle well defined. *Neuration*, 12 veins; 3 and 4 from a common stem; 5 and 6 short; 8 and 9 from a common stem; 10 separate at its origin.

Hind-wings 3-lobed, the first fissure extending to one-fourth from the base, the second fissure nearly to the base; the third lobe ornamented with a projecting tuft of scales. *Neuration*, 8 veins; 4, 5, and 6 short, all separate, to end of upper fissure.

Abdomen broad, ornamented above.

Hind-legs with two pairs of long equal spurs, distinctly tufted at the joints above.

This genus is apparently more nearly allied to *Deuterocopus*, Z., than to any other. It differs from *Oxyptilus* in the complete separation of vein 10 from the origin of 8 and 9, in which respect it agrees with *Platyptilia*, the excavate margin of the second lobe of the fore-wings at once distinguishes it from that genus; the tufted legs and the absence of a projecting tuft in front of the head cause it to approach *Eucnemidophorus*, Wlgrn., which agrees with *Platyptilia* in neuration.

I name the genus in honour of my friend, Mr. Gilbert T. Carter, C.M.G., Governor of Lagos, who has sent me this and many other interesting species.

GILBERTIA EQUES, *sp. nov.*

Antennæ ferruginous at the base, beyond it on the upper-side black, spotted with white; whitish beneath.

Palpi ferruginous; somewhat recurved, twice as long as the head; apical joint about half the length of the second joint, which has a whitish spot at its end on the inner side.

Head dark ferruginous-brown.

Thorax ferruginous, with a broad white transverse bar in front, and another behind it, the latter coming forward on the sides and almost joining two conspicuous white lateral patches on the under-side.

Fore-wings cleft to more than one-third of their length, apical lobe depressed at the apex, second lobe strongly scalloped; dark ferruginous-brown; an indistinct paler ferruginous streak below the costa on the basal fourth; another about the middle of the costa, having some white scales at its lower edge; a pale ferruginous bar across the base of the anterior lobe, in which are also some white scales, is followed by a blackish streak in the costal cilia, which are pale ferruginous beyond it, extreme apex blackish; on the dorsal margin is a minute white spot about the end of the dorsal third; a broad white transverse bar crosses the base of the second lobe, and is followed by some scattered white scales in the cilia within the cleft, which, with this exception, are dark ferruginous-brown; on the dorsal margin, below and before the white bar, the cilia are pale ferruginous, beyond it dark purplish-brown, then again pale ferruginous within the crescent-shaped apical margin, which is preceded by an oblique line of white scales. Exp. alar., 14 mm.

Hind-wings, anterior lobes cleft to two-thirds of their length; pale ferruginous before the cleft, shading into deep purplish-brown beyond it; third lobe pale ferruginous, with a small triangular tuft of deep brown scales at the middle of the dorsal margin, and a broad spatule of dark purplish-brown scales at the apex, preceded by projecting white scales on the dorsal margin immediately before it.

Abdomen ferruginous, with a broad, conspicuous, raised, shining white band before the middle, beyond which is a second interrupted whitish band, and beyond it a third, uninterrupted, but less conspicuous, than the first.

Legs ferruginous, barred with conspicuous white bands above, fringed at each joint with long erect ferruginous scales; spurs very long, the inner one longer than the outer (reaching a length of nearly 2 mm. in the anterior pair), white, tinged with ferruginous, and blotched with blackish on their outer sides; second pair of spurs of equal length.

Hab.: GOLD COAST, Accra, one specimen, 1881 (*Carter*).

Type, ♀, Mus. Wlsm.

UTUCA, Wkr.

Cat. Lp. Ins., B. M., XXX, 951 (1864).

Type *Utuca ochracealis*, Wkr.

Antennæ (♀) simple, more than half the length of the wings.

Maxillary palpi obsolete.

Labial palpi recurved, closely appressed; apical joint, porrect, scarcely projecting beyond the front of the head.

Head clothed with bifid scales.

Fore-wings narrow at the base, gradually and evenly widened outwardly, apex depressed and rounded, anal angle ill-defined, apical margin very oblique; a very short fissure from above the middle of the apical margin cannot be said to divide the wing into two lobes, amounting as it does to scarcely more than a strong indentation. *Neuration*, 11 veins, 5 apparently wanting; 1 shortly furcate at base; 2 from outer third of cell; 3 and 4 closely approximate at base, from the anal angle of cell; 6 and 7 from upper half of cross-vein, enclosing the termination of the short fissure; 8 and 9 from a common stem, 8 to apex; 10 arising very close to 8 and 9.

Hind-wings 3-lobed; first two lobes lanceolate and somewhat wider than the third lobe, which is of even width throughout; the upper fissure reaches to about one-third the length of the wing, taken from the apex of the second lobe; the lower fissure, measured by the same lobe, extends to four-fifths of the wing-length; cilia rather short, without tufts or teeth of scales. *Neuration*, 8 veins; 8 to apex of upper lobe.

Abdomen stout; much ornamented.

Legs with equal spurs, not tufted.

The neuration of this genus would place it close to *Alucita*, L., as defined by Meyrick, Trans. Ent. Soc. Lond., 1890, 487—8.

UTUCA OCHRACEALIS, Wkr.

Cat. Lp. Ins., B. M., XXX, 951 (1864).

Antennæ greyish-fuscous.

Palpi greyish-fuscous.

Head white, mottled with greyish-fuscous around the neck and eyes.

Thorax and *tegulæ* reddish-orange, with a greyish-cinereous spot posteriorly. Under-side white, mottled with greyish-fuscous.

Fore-wings and *cilia* unicolorous, cinereous. Exp. alar., 23 mm.

Hind-wings and *cilia* unicolorous, cinereous.

Abdomen white, with four transverse bands of greyish-fuscous, connected by a central line, which is dilated between the last two, so as to cover nearly the whole upper-side of the segment, a slender lateral of the same colour passes along the side. Under-side white, mottled with greyish-fuscous.

Legs cinereous; tarsi white.

Hab.: BRAZIL, Ega (*Wkr.*).

Two specimens, ? Bolivia, labelled "La Industria Haziendo, Guarino" (Zell. Coll.).

UROLOBA, *gen. nov.*

Type *Uroloba fuscicostata*, Wlsm.

Antennæ pubescent in ♂.

Maxillary palpi obsolete.

Labial palpi erect, closely pressed together, not reaching above the eyes, clothed with rough but scarcely projecting scales.

Eyes very large and prominent.

Haustellum long, slender, naked.

Head with a short projecting frontal crest of bifid scales.

Fore-wings elongate, dilated outwards, costa almost straight, apical margin with a conspicuous notch immediately below the apex, which is depressed, attenuated and falcate; below the notch the margin of the wing is obtusely angulated, thence obliquely and slightly convex in the direction of the anal angle. *Neuration,* 11 veins; 5 apparently wanting; 8 and 9 from a common stem, 8 following the curve of the falcate apex; rest separate.

Hind-wings 3-lobed, the first fissure reaching to about one-third from the apex, the second fissure to within one-fourth of the base, without teeth or tufts of scales. *Neuration,* 8 veins; all separate.

Abdomen somewhat tufted at the sides; lateral claspers of ordinary length.

Legs, first and second pairs somewhat thickened at the joints; posterior pair with very short spurs, in the first pair having the inner spur longer than the outer, in the second pair both spurs are of equal length, a few long scales project over the joint above them.

This genus agrees with *Utuca* in neuration, but differs in the more thickly clothed palpi, and in the more distinctly falcate apex of the fore-wings, of which the very short fissure is placed decidedly higher than in that genus.

UROLOBA FUSCICOSTATA, *sp. nov.*

Antennæ brownish-fuscous.

Head, thorax, and *palpi,* very pale fawn colour, much shaded and sprinkled with reddish-brown.

Fore-wings pale fawn colour, much sprinkled with reddish-brown and brownish-fuscous scales, the latter predominating below the middle of the costa, at the base below the fold and along the extreme costal margin; cilia tinged with brownish-fuscous, especially about the anal angle. Under-side with the costal margin broadly streaked with black, reaching from the base to that point where the margin begins to be depressed towards the apex, the widest part of this band of black scales being about the middle of the wing. Exp. alar., 22 mm.

Hind-wings pale fawn, sprinkled with pale brownish scales; cilia very pale fawn, brownish-fuscous at their bases around each of the lobes. Under-side with a line of deep black scales reaching along the costa as far as the base of the first fissure, there are also a few blackish scales beneath the cilia, helping to give them that fuscous appearance which is visible on the upper-side.

Abdomen fawn colour, dusted with brownish-fuscous, the scales on the sides of the posterior segments project laterally.

Legs whitish fawn colour, sprinkled with brown scales, especially at the joints.

Hab.: CHILÉ, Valparaiso (*J. J. Walker*).

Type, ♂, Mus. Wlsm.

This species is represented in my collection by two specimens, both males, collected at Valparaiso for which I am indebted to Mr. J. J. Walker.

Merton Hall, Thetford:
June, 1891.

ANNOTATED LIST OF BRITISH *TACHINIIDÆ*.

BY R. H. MEADE.

(*Continued from page* 232).

16.—CHETOLYGA, Rnd.

NEMORÆA, pt. Mgn., Mcq., Schn.

Gen. ch.—Eyes hairy, more or less approximated in the males, and prolonged to near the bottom of the sides of the head and face; antennæ drooping, second joint elongated, and more than half the length of the third; cheeks hairy; chin short; facialia nearly or quite bare; abdomen without discal setæ on the middle segments; hind tarsi of females not dilated.

1 (2) Anal segments black .... 1. *amœna*, Mgn.
2 (1) Anal segments red.
3 (6) Thorax with five stripes.
4 (5) Antennæ with third joint widened, and second abdominal segment with four marginal dorsal bristles .... 2. *analis*, Mcq.
5 (4) Antennæ with third joint narrow, and second abdominal segment with only two bristles .... 3. *nigrithorax*, Egg.
6 (3) Thorax with four stripes ....4. *quadripustulata*, F.

C. AMŒNA, Mgn.

N. exacta, Wlk.

Eyes of male approximated; antennæ black, with the third joint rufous at the base, and about one and a half times as long as the second; cheeks thinly clothed with fine black hairs; palpi red; thorax black, thickly coated on front and sides with white pubescence, and marked upon the dorsum with five distinct longitudinal striæ; also having four external dorso-central bristles behind the transverse groove; scutellum rufous; abdomen black, with sides red in the male, and marked in both sexes with broad tessellated irregular white bands; anal segments black; legs black, tibiæ sometimes piceous. Rare; found by Mr. Harwood, of Colchester, who kindly sent me a female; it is also in Mr. Verrall's collection, who possesses the typical specimen named *N. exacta* by Walker.

C. ANALIS, Mcq.

cruentata ?, Rnd.

Eyes sub-approximate in the males, and not very widely separated in the females; cheeks yellow or white, and glistening, having brown reflections, and furnished with fine black hairs; fronto-orbital bristles long and numerous, being very thickly set and rather irregular in the males; antennæ rather long, the second joint being about two-thirds of the length of the third joint, which is somewhat dilated, especially in the females; arista long, and thickened for half its length; palpi rufous; thorax shiny blue-black in the male, with a little grey or tawny pubescence on the sides and front margin, and marked with five rather indistinct longitudinal stripes; the female has the stripes much more distinct, and the thorax clothed with more pubescence; the external dorso-central bristles are four in number behind the transverse groove; scutellum rufous; abdomen black, with the sides and anus red in both sexes, and transversely banded with white tessellations; the first segment is quite black, armed on the margin with two central dorsal setæ, the second segment having four setæ; legs black, hind tibiæ ciliated externally with an even row of rather short bristles; the wings have the outer cross veins very sinuous. Rare; Mr. Billups sent me a male, which he had captured at Dulwich.

C. NIGRITHORAX, Egg.
cilicrura ?, Rnd.

This species is so similar in most of its characters to *C. analis*, that I shall only point out the chief marks of distinction between them. The antennæ are shorter, and the third joint is narrow and undilated; the fronto-orbital bristles are less numerous, being placed further apart; the palpi are dark at the base, and have their ends quite pale; the first abdominal segment has no large setæ on its margin, and the second segment is armed with only two spines instead of four, as in *C. analis*. This is also rare; Mr. Billups sent me one for my inspection, bred from *Saturnia carpini*.

C. QUADRIPUSTULATA, F.
T. æstuans, Fln.
N. erythrina ?, Mgn.
T. dispecta ?, Wlk.

This species bears a great general resemblance to both the preceding ones, and Fabricius probably confounded all three together. The eyes are approximated in the male, and moderately remote in the female; the fronto-orbital bristles are numerous, but not very large; the antennæ are black, those of the male have the second joint elongated, and about two-thirds of the length of the third, which is rather narrow; in the female the second joint is rather short, and only about half the length of the third, which is wide; the arista (especially in the male) is long and thickened for about half its length; the palpi are testaceous; the thorax in the male is shiny blue-black with little pubescence, and rather indistinctly marked on the front part with four longitudinal lines of moderate width; in the female the thorax is covered with hoary pubescence or tomentum, and very distinctly striped, the stripes extending over the whole dorsum; there are four external dorso-central bristles behind the transverse groove; the scutellum is tawny; the abdomen is more or less extensively marked on the sides with red or yellow in the male, the apex and venter being also of the same colour, the dorsum is shiny black, with some white tessellations on the edges of the segments; in the female the abdomen is dark grey, tessellated with black and white, having an indistinct black dorsal band, and sometimes a little red on the sides of the middle segments; the anus is always red; the first abdominal segment, which is black, has two long bristles on the edge in the centre, the second segment has four setæ in the same position in the female, and usually six in the male; the wings have the outer cross veins a little sinuous; the legs are black, and have the hind tibiæ ciliated, as in the two preceding species. Rare; it is in Mr. Coryndon Matthew's collection, and in Mr. Verrall's; the latter kindly sent for my inspection Walker's typical specimen of *T. dispecta*, which I find to be a well marked example of the present species. Walker describes the palpi as being black, but I find them pale in colour, in his own specimen.

17.—NEMORILLA, Rnd.

NEMORÆA, pt. Mgn., Mcq., Schn.

Gen. ch.—This genus, like the former (*Chetolyga*), differs from *Nemoræa* by having the eyes prolonged, and the chin short, so that the antennæ are inserted above, instead of opposite to, the centre of the eyes. The points of distinction between *Chetolyga* and *Nemorilla* are, that in the latter the cheeks are bare, instead of being hairy, and the central abdominal segments are armed with setæ both on the disc and on the edges, instead of only on the latter parts, as in *Chetolyga*. The two genera agree in all other essential points.

N. FLORALIS, Fln., Zett., *non* Mgn.
notabilis, Mgn., Schn.
T. intersita ?, Wlk., ♀.

This, the only recorded British species, has the eyes approximated in the male, and rather widely separated in the females; the antennæ have the third joint rather narrow, and about one-third longer than the second; the arista is long, and thickened for nearly half its length; the palpi are black in the male, but sometimes pale in the female; in which sex the basal joints of the antennæ are also sometimes rufous; the thorax is black, with grey pubescence, and marked with three wide black stripes, the middle one, which is the broadest, being often divided into three; the scutellum is black or grey; the calyptra are dirty white; the abdomen is black, covered with grey pubescence, and marked by a dorsal black line, and with transverse dentated bands on the second and third segments, that on the former being wider than the other, and having the marks running together to form a somewhat square-shaped spot; the anal segments are black, the sides of the second segment are generally slightly rufous in the male; the wings have the outer cross vein sinuous; the legs are black, and have the hind tibiæ ciliated externally with slightly uneven bristles. This fly is not uncommon; I received one many years ago from the late Mr. Cooke, of Bowdon, which he had bred from *Botys verticalis*, and Mr. Billups has one reared from *Plusia festucæ*. Mr. Verrall kindly sent for my inspection the typical specimen of Walker's *T. intersita*, which he had obtained from the late M. Desvigne's collection. I find that it is a female of the present species, though Walker's own description does not exactly agree with it, for he says that it should have four dorsal thoracic stripes, whereas the specimen has but three, or rather five, the central one being divided.

18.—OLIVIERIA, Desv. *non* Mgn.

PANZERIA, Mgn.

Gen. ch.—Eyes thinly haired, sometimes nearly bare, approximate in the male, and rather remote in the female; cheeks and facialia bare; antennæ free, with the second joint elongated, and nearly as long as the third; arista with the second joint a little prolonged, and the third thickened at the base, rather short, and sub-pubescent; epistome prominent; proboscis long, slender, and porrected; abdomen oblong and elliptical, armed with setæ on the disc of the segments; wings with the first posterior cells very slightly open at the apex, and often quite closed or even stalked. This genus is rather aberrant, and from the structure of the wing it might be placed in the second division of my analytical table.

O. RUFOMACULATA, De G., Rnd.
lateralis, F., Mgn., *et alia.*

Cheeks and sides of frontalia silvery-white, with black reflections; antennæ and palpi black; thorax grey, with four black stripes, the central pair narrow, the outer ones broad; abdomen black, the rings with narrow white bands on their front edges, and having the sides of the three first ones dark red; wings greyish, with the roots, front margin, and sometimes the borders of the veins ochreous. Common.

19.—ZOPHOMYIA, Mcq.

EREBIA, Desv., Mgn.
AVERNIA, Rnd.

Gen. ch.—This small genus contains one or two shiny black bristly species, resembling some of those in *Macquartia* in general appearance, but differing by being more setose, and having the eyes widely and nearly equally separated in both sexes. The eyes are thinly but rather longly haired in the males, and almost nude in the females; the fronto-orbital bristles are in a double row on each side towards the vertex in both males and females; the antennæ are drooping, with the second joint rather long, but nearly one-half shorter than the third; the arista is rather short and thickened at the base; the abdomen is conico-cylindrical, with setæ on both the middle and edges of the rings, the anal segments in the male are rather large and incurved; the wings have large costal spines, and the angle at the base of the apical cross veins somewhat rounded; the legs are very spinose.

Z. TEMULA, Scop., Schn.
tremula, L. F., Mgn., Mcq., *et alia.*
flavipalpis ?, Mcq., pt.

This is rather a peculiar-looking fly, having a shining black body with bright reddish-yellow scales and basal halves of the wings; the forehead is prominent; the antennæ black, with a red tinge at the end of the second joint; the palpi have the bases dark, and the ends reddish-yellow;* the thorax, like the abdomen, is immaculate, has a little white pubescence on the front edge, and numerous strong bristles on

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* I have only examined three specimens, which all have the palpi of this colour; they are generally described as being black; are these belonging to Macquart's *flavipalpis?*

the sides; the abdomen is conico-cylindrical, very glabrous, and has all the setæ large, and those on the fourth segment very numerous; the wings have the fourth longitudinal vein bent at rather a rounded angle, and the outer cross vein a little curved, but not usually sinuous; the legs are black, and armed with numerous strong spines irregularly arranged. Not common.

(*To be continued*). 324

ON THE ALTERATION IN THE FORM OF THE SCALES OF *LECANIA* CAUSED BY INTERNAL PARASITES.

BY R. NEWSTEAD, F.E.S.

Last year, when examining a number of specimens of *Lecanium fuscum*, I found among them a single one almost as large again as the rest, and of a different form; so much so, that I considered it a distinct species, until upon removing it from the branch for closer examination I saw in it some parasitic larvæ, and as this was the only example that contained such larvæ, the thought occurred to me that the form of the scale might have been abnormally altered by the parasites. I communicated my observations to Mr. J. W. Douglas, who replied that my statement was important, but required further proof.

This year I have examined a good many species of *Lecanium*, and find that several are subject to considerable variation in the form of the scale, and this entirely from the attacks of internal parasites. Of these there are at least two species very common, and both, so far as I have been able to trace, produce abnormal swellings, peculiar to the species, on the dermis of the host. The most important of these is that which produces one, two, or more large tubercular swellings—generally two; when the latter is the case the scale appears quite symmetrical, one of the swellings being on either side of the dorsum, each opposite to the other. When there is but one large tubercle, it is invariably situate on one side of the dorsum, thus giving the scale a "lop-sided" appearance, which at once attracts the eye as curious and unusual. I find that each of these tubercular swellings, if examined in season, as a rule contains a single parasitic larva, or if more are present, there is but one large swelling, which gives the scale a heaped-up or gibbose form. Such forms I find common in the following:—*Lecanium æsculi*, *fuscum*, *genevense*, and *capreæ*, especially in the two latter. I should add that the portions of the dermis affected by the parasites are devoid of the ordinary reticulation, and in the specimens much swollen the integument becomes almost transparent. It is somewhat exceptional for the perfected parasites to escape through the dermis by making and leaving the usual perforations, they more frequently leave the body of their host through the anal cleft, as there is no other means of escape if they have not made such for themselves. When this is the case, they appear to have completed their metamorphoses below the ventral skin of the host, thus the scale remains apparently intact, and one can easily see how such specimens would pass for perfect; they, however, have had the whole interior eaten away, but when the parasites escape through the dermis, the ventral surface generally remains entire.

At present I am unable to single out this parasite from other species which appear at the same time; this, however, could be easily accomplished by keeping the scales isolated. For the time being the foregoing is sufficient to show that the greatest care should be exercised to select unparasitized specimens for description; for while some parasites may not materially affect the exterior of the scale, they are quite capable of malforming the antennæ and legs, especially such species as feed upon the larvæ and ova when in the scale.

Grosvenor Museum, Chester:
July 28th, 1891.

REMARKS ON THE ALTERATION OF THE AERIAL HABITS OF CERTAIN GALL-FORMING *APHIDES*.

BY G. B. BUCKTON, F.R.S.

Though there is nothing new in the record of subterranean forms obtaining in many genera of *Aphides*, there may be some interest felt in the following note. Subterranean habits have been observed in the genera *Siphonophora*, *Aphis*, *Pemphigus*, *Schizoneura*, *Paracletus*, and *Trama*. In plate cxii of the "Monograph of British Aphides," may be seen figures of *Pemphigus lactucarius*, and also a section of a clod of earth, exposing a cavity containing numerous immature forms of the same insect.

Again, in plate cxiii, figures may be seen of the bottle-like purses made by *Pemphigus bursarius*. M. Jules Lichtenstein, as is well known, bestowed much attention upon Homopterous insects, and he assumed that the great part of the *Pemphiginæ* and *Phylloxerinæ*, in their second phase of development, were winged, and that in this condition they migrated from the ordinary food-plant to form hibernating colonies. His observations suggested to him the name "*Pseudogyna migrans*," for an expression of this condition of their development.

He regarded this emigration rather as the rule than the exception in the genera comprised in this section of the family. Moreover, in a letter written to me in 1883, and subsequently published, he states his conviction that emigration may take place from one plant or tree, to another plant or tree of an entirely different botanical family, and he states, amongst other examples, that the winged forms of *Tetraneura ulmi* hibernate on *Triticum repens.*

Passerini has shown that the immature forms of *Pemphigus Boyeri* (*Aphis radicum* of Fonscolombe) feed below ground on the roots of various plants, such as *Zea, Sorghum, Lolium,* &c. M. Lichtenstein considered that the period of two years is necessary to complete the evolution of *Pemphigus bursarius.* The galls made by this Aphid are formed on the petioles of the leaves of the Lombardy and the black poplar tree. They are pear-shaped, and when ripe show reddish apertures at their summits, out of which, from late in May to the end of July, the winged insects emerge, and then take their flights.

M. Lichtenstein, in conjunction with M. Courchet, placed a number of these insects with growing grasses under glass bells to note if they made any descent to the earth round the roots; but up to 1881 no direct proof could be adduced that such were the hibernating habits of this species. Oviposition of some *Pemphiginæ* has been proved to take place under the bark of trees by Messrs. Riley and Monell; but they thought it probable that certain species might be subterranean and root-feeders during some portion of their existence. (See "Notes on Aphididæ of U. S. America, Washington, 1879").

One requisite of a scientific thinker consists in being a good sceptic or doubter; that is to say, although the mind must be receptive of all fair deduction from undoubted premises, theory and hypothesis must continue in abeyance until such premises rest unquestioned.

In 1881, I hesitated to accept as proved some of M. Lichtenstein's deductions, and I preferred to take up a neutral position as to the question of emigration of *Aphides,* such as that of *Tetraneura,* from the elm tree to the roots of grasses.

Through the kindness of Mr. Mosley, of Huddersfield, I am able to add another item to the proof that emigrating forms of an aerial species feeding on leaves of a forest-tree may retire to the roots of low herbs, with a view to hibernate; and that they again issue in the spring, previous to the development of the perfect sexes.

On the 13th July of the present year, Mr. Mosley, entomologizing near a wood in the neighbourhood of Huddersfield, saw some plants of the common buttercup (*Ranunculus repens*), quite white with specimens of a woolly aphid, most of which were clustered upon the stem and leaves of the plant.

These insects were forwarded to me by post, together with a portion of the roots and some earth accompanying them. I found the insects chiefly located under the crown of the root amidst a quantity of cotton-like flocks interspersed with the earth. Unfortunately, two fat larvæ of a Dipterous fly (*Syrphus*), which seems, fortunately for the existence of vegetation, to be almost constantly found in company with Aphid swarms, had sucked dry most of the specimens.

An examination under the lens of those which remained proved to be interesting, by showing these insects to be the viviparous forms of *Pemphigus bursarius.* Mr. Mosley again visited the spot a fortnight later, but he was astonished to find that the insects had almost entirely disappeared from the leaves, and it is highly probable that the insects had passed into the earth. No poplar trees were in the immediate vicinity of the spot, but a row of the Lombardy poplar flourished within a hundred and fifty yards of the place. The footstalks of the leaves of these trees were swelled up into numerous purse-like pseudo-galls, which is the commonest form of these excrescences resulting from the attacks of the last-mentioned *Pemphigus.*

Mr. Mosley informs me that he has seen the buttercup similarly attacked in another place about five miles distant from the before-mentioned wood near Huddersfield.

A nursery ground is situated about two miles away from this last locality, in which there are poplar trees whose leaves are often deformed by the purses of *Pemphiginæ.* This intervening distance may seem somewhat great, but the large wings of the insects are well fitted for transporting them upon every gentle wind which may happen to blow; and, indeed, it is well known that swarms of *Aphides* travel to great distances, like clouds, under certain conditions of the atmosphere.

As a conclusion to this notice, attention may be directed to the comparatively little known section of the *Aphidinæ*, named by Passerini *Rhizobiinæ*; almost all the examples of which hitherto have been described as apterous.

The forms assumed by *Aphides* from moult to moult are diverse, one from the other; and we may surmise that future observation will reduce the number of the insects now regarded in this section as species, by showing some of them to be only the subterranean conditions of insects, the aerial habits and forms of which are better known to us.

Artificially, it is difficult to bring about such a change of life and food, even when the right growing plants have been selected. In the present case it is therefore satisfactory to find the presence of the *winged* forms of a tree species, which cannot well be mistaken, nestling in numbers on a small trailing plant, previous to its descent into the ground, much in the same manner as we see the *Phylloxera* descends to the vine root at certain seasons.

Haslemere:
August 15*th*, 1891.

APLOTA PALPELLA BRED.

BY JOHN H. WOOD, M.B.

You will be interested to hear that I am breeding at the present moment *Aplota palpella*. For several seasons I had noticed a strange larva on an old mossy sandstone wall, and guessed it should be something good; twice was I beaten in the attempt to rear it, but the problem is at last solved, and now every afternoon I have the pleasure of finding two or three *A. palpella* resting with folded wings on the moss in my glass vessels.

The larva lives *gregariously*, in silken galleries, on the surface of the moss, and kills the plant in its progress, the dead moss afterwards often becomes covered with a lichenous growth; the larva feeds on the moss, not on the lichen. July 31st, 1891.

The first moth emerged on July 19th, and they kept on appearing almost daily for a fortnight or better. Seeing what a good insect I had bred, I went on the afternoon of July 23rd in search of the pupæ, of which I obtained a modest supply by stripping off a patch or two of the moss where the galleries of the larvæ were visible. These galleries are of white silk, interwoven on the outside with fragments of the moss. I hoped, too, that I might see the moth itself at large, but in this was disappointed, for I did not then know that its habit in the day time is to sit with wings pressed close to its sides on its food plant, depending for its protection so entirely on the likeness which its yellow scaling gives it to a projecting bit of the moss, as scarcely to be induced to move even by a touch of the finger. Yet I may add, that it was active enough after dusk in my vessels, and skipped or ran about, rather than flew, with wings carried out horizontally from the body, in the jerky *Gelechia* fashion that is known so well.

On August 15th I met with a worn specimen (the only one I ever saw at large) sheltering from a stiff wind on some park palings, distant four miles at least from the sandstone wall, and of quite a different aspect; the one being in the midst of a rich and flat agricultural district, the other on the hills with a limestone soil, rich only in productions dear to a naturalist, or a lover of the picturesque.

My earliest date for the larva is February 9th, this was in 1889. They were then about 3‴ long and apparently hibernating, they seem to wake up irregularly, for some have made considerable progress by the middle of April and have brought their galleries up to the surface, while others have grown but little and still keep their galleries out of sight underneath the moss, in the position they occupy through the winter. They are provokingly slow feeders, hence the chief difficulty if the attempt be made to rear them indoors.

This year I deferred collecting them till May 25th, selecting two of the patches that had the strongest galleries, yet these larvæ were still feeding and appeared likely to continue doing so for a while, when I examined them for the last time on June 6th and took their description.

The moss they are eating on this wall is the common creeping species, *Homalothecium sericeum*, but I do not suppose that the insect can be restricted to this single kind.

I have just found a belated individual, newly emerged, in the vessel containing the pupæ of July 23rd.

Tarrington, Ledbury:
August 22*nd*, 1891.

Description of the larva of Aplota palpella.—The adult larva is long and slender, of nearly uniform bulk from end to end, and with the segmental divisions only moderately defined, their skinfolds being white. Ground-colour pale greenish-white or yellowish-white. A purple band, with the edges (especially the upper one) irregular and broken, occupies the subdorsal region, becoming fainter and narrower at the divisions. A paler band of the same colour runs along the spiracular region, and is even more broken and irregular than the subdorsal, being divided on each segment into two separate portions. Immediately below the spiracular band is a whitish skinfold, and then come the underparts, which are of the ground-colour. Head and thoracic plate shining black, the latter with a pale dividing line, not reaching the anterior border. Anal plate ochreous-brown. Legs of the ground-colour. Spots small and indistinct; the trapezoidals lying in the subdorsal bands, nearly in a line. Hairs pale and rather long.

The hibernating larva only differs in that the bands are darker and redder, and in having a reddish suffusion on the back between the subdorsal bands, more especially, and sometimes only, on the anterior and posterior parts of the segment.

The pupa lies in a flimsy cocoon at the end of the gallery. It is pale yellow, wing cases and all. On the abdomen are four rows of narrow, transverse, pale brown marks, the remnants, as I read them, of the larval bands. In the subdorsal rows each segment has two marks, one about its centre, the other on its extreme posterior edge; in the spiracular row the central mark is absent, and only the one on the posterior edge present. These marks, however, must melt away at some time or other, for they are not to be found in the exuviæ. The anal extremity ends in a large curved process, which divides into four hooklike bodies. On the back of the segment next the anal are also a pair of curved processes. With such an arrangement the case is held firmly in position, whilst the moth is escaping.—J. H. Wood, Tarrington, Ledbury: *August 22nd*, 1891.

DESCRIPTION OF THE LARVA OF *EUPŒCILIA PALLIDANA.*

BY EUSTACE R. BANKES, M.A., F.E.S.

The welcome discovery of the larva of *Eupœcilia pallidana* in seed heads of *Jasione montana* is chronicled by the Rev. C. R. Digby in Ent. Mo. Mag., xxiv, p. 89, but as no description of the larva has been published, I append one, drawn up on July 30th from a few full-fed examples.

Length, 4—5 lines. Head and 2nd segment (of which the posterior part is the darker) vary from brown to blackish-brown. The body, which is short and obese, stoutest in the middle, and getting narrower towards the head and tail, is of a beautiful rosy-pink with a greenish tinge. The only conspicuous part of the anal plate is the central area, which is brown or blackish-brown. There are no visible spots, and the bristles are very pale and inconspicuous. Portions of an internal vessel, which I take to be the alimentary canal, often show through the semi-transparent body as darker blotches. Ventral surface yellowish-white, with a more or less pronounced greenish tinge. All the legs and claspers semi-transparent yellowish-white; there is a very slender black streak noticeable where the anterior side of each true leg joins the body.

The Rectory, Corfe Castle
August 26th, 1891.

Ephestia pinguis in the Isle of Purbeck.—On August 13th the Rev. C. R. Digby netted a fine specimen of this local moth, which he had beaten out from the tall side hedge (composed of mixed growth, in which ash was of course represented) of a copse near this house. This is the first occasion on which *E. pinguis* has been met with in the county of Dorset, and the capture is all the more encouraging, as I have so often searched for it in vain on ash trunks round here. From the same hedge I had the good fortune to secure two specimens of *Tinea albipunctella* on the following day, and altogether we took about three or four examples apiece of *Peronea Schalleriana*, var. *latifasciana.*—Eustace R. Bankes, The Rectory, Corfe Castle: *27th August*, 1891.

Coleophora salinella two years in the pupa state.—On October 24th, 1889, I collected on the Chesil Beach some larvæ of this species, but only very few moths emerged (August 20th to September 9th) last year. As, however, I thought that the cases might perhaps be useful to some one, the old dry handful of *Atriplex portulacoides* to which they were attached was not thrown away, and this has, to my surprise, produced several specimens of *C. salinella* during the last three or four weeks! Unluckily none of the cases had been cut open and examined during the last twelve months, but it seems almost certain that their tenants had passed that period *as pupæ*, and it would be interesting to learn whether a similar occurrence has been noticed with any other *Coleophora* besides *Frischella*. A few species, such as *fuscocuprella*, *alcyonipenella*, &c., are, of course, known to spend more than one year as feeding larvæ; but is it not possible that our very limited amount of success in breeding some of the genus may occasionally be due to the fact that the cases containing pupæ, which would produce imagines in the second year, are thrown away too hastily when the breeding jars are cleared out at the close of each season?—Id.

Acrolepia marcidella in the Isle of Purbeck.—It is very satisfactory to be able to record the occurrence of a second specimen of this extremely rare species in Purbeck. It was taken by the Rev. C. R. Digby on July 3rd last, and was found crawling up a grass stem close to a thatched shed (where it had doubtless hibernated) at about 7 p.m., within a few yards of the spot where Mr. Digby took his first specimen in June, 1886 (Ent. Mo. Mag., xxiv, p. 42). Having been fortunate enough to be present on both occasions, I have had the pleasure of examining the specimens whilst still alive, and Mr. Digby most generously made me a present of this second example on the spot. Unluckily it was worn to a mere shadow of its former self, and no wonder, considering that it had lived as an imago ever since the previous autumn! I regret to say that we have not been able to obtain the slightest clue to the food plant of the larva, and a recent search for the larva itself produced no result.—Id.

Curious instance of re-union between the same moths.—In June last I was breeding some *Ephestia Kühniella*, and one evening, at about 9.30, when looking into the jar in which the moths were emerging, I noticed a pair *in cop.* As I was anxious to obtain eggs, they were induced to move, just as they were, into a large glass-bottomed box, the greatest care being taken not to disturb them, and later on that night they were still paired. By the next morning, however, they had separated, but being too busy to kill and set the male that day, I left him where he was until the following morning, when, on looking into the box at about 8.30 a.m., I found, to my astonishment, that the moths were again *in cop.*, 35 hours after they had originally united! As the sexes seemed as a rule to pair off at about 9—10 p.m., it is most probable that they had been in that position since the previous night. It would be particularly interesting to learn whether similar instances of a second act of copulation between the same individual ♂ and ♀ (after they have once separated *naturally*) have been observed, as I should fancy that it must be a most unusual occurrence.—Id.

Note on Gelechia lutulentella.—It is hardly necessary to apologize for my satisfaction at finding that I unintentionally maligned *G. lutulentella* when stating in Ent. Mo. Mag., vol. ii (2nd series), p. 196, that it seemed to be always very solitary in its habits. I have lately come across the three or four specimens taken with the one mentioned in my note, and they prove that it was flying *not* in company with *G. lentiginosella*, but with other (though very differently coloured) individuals of its own species. This season I have had the good fortune to secure a nice series of *G. lutulentella*, and find that it varies in colour to a wonderful extent, from glossy black to glossy pale yellowish-brown.—Id.

Re-occurrence of Arge Galathea in East Yorkshire.—On the occasion of our Excursion of the Yorkshire Naturalists' Union to Sledmere in East Yorkshire on Bank Holiday, Monday, August 3rd, *Arge Galathea* was turned up in its old locality there. Formerly this species was known to occur commonly at Sledmere, and also in several other Yorkshire localities, but had been regarded by Lepidopterists as quite extinct in the county for probably some twenty-five years.—Geo. T. Porritt, Huddersfield: *August*, 1891.

Pterophorus paludum in Yorkshire.—When collecting on Thorne Moor, near Goole, in company with Mr. John Harrison, of Barnsley, on the 18th of July last, I boxed a small "Plume," which I quite failed to recognise. On making a careful examination of it last week, I found it agreed closely with the Dorsetshire specimens of *P. paludum* in my cabinet, but as none in my series were in such good condition, nor quite so large as my capture, together with my doubt as to the likelihood of *paludum* occurring so far north as Yorkshire, I at once sent it off to my friend Mr. Sydney Webb, of Dover (who knows the species of this group as well as any one), for his opinion. His reply on returning the specimen was as I had anticipated, "*paludum*, a very fine and large specimen."—Id.: *September 7th*, 1891.

Callimorpha Hera in Devonshire.—As I believe some doubt exists as to the claims of *Callimorpha Hera* to be considered as established as a British species, a note of its recent capture in Devon may be worth publication. My neighbour, Major-General Carden, who has recently returned home from Teignmouth, yesterday showed me seventeen specimens of *C. Hera*, all of which he assures me he caught last August, in five days, in the neighbourhood of Teignmouth. He states that had he been favoured with reasonable weather, he would probably have caught a much larger number. I am not aware that the capture of so large a number of specimens of the species in England by any one collector in one season has been previously recorded.—H. Goss, Surbiton Hill: *September 12th*, 1891.

Acronycta alni at Hoddesdon.—On August 21st I found in the garden a larva of *A. alni*. It is now safely in cocoon in a piece of "touch-wood." I believe it is new to this county.—F. M. Campbell, Rose Hill, Hoddesdon: *Sept. 19th*, 1891.

Eros minutus in Gloucestershire.—I captured a single specimen of this beetle on the 19th September, 1885, as it was crawling over an old beech stump in the Westridge Wood near here. I have never been able to meet with another specimen until the 9th inst., when I had the satisfaction of taking two more by beating young oaks, where the foliage was very thick; I have tried again twice since but without success.—V. R. Perkins, Wotton-under-Edge: *September 17th*, 1891.

Bombus lapponicus at Wotton-under-Edge.—I have had the satisfaction of adding this fine bee to our local list. I captured a female on the 15th inst. in the garden, on the flowers of one of the Michaelmas daisies; I thought at first it was a *lapidarius*, but being rather doubtful I boxed it, and discovered my prize. This particular daisy has a great attraction for bees and flies, and when the sun shines, which is only once now and again, the flowers are full of life.—Id.

Aculeate Hymenoptera at Lowestoft in August, 1891.—I have been spending the first three weeks of August close to Lowestoft, where, from the accounts given by the late Mr. F. Smith, who visited the place at exactly the same season in 1858, I was hopeful of picking up some of the rarer Aculeate *Hymenoptera*. In this I was not altogether disappointed, though the weather was, on the whole, singularly unfavourable. Halfway between Lowestoft and Pakefield, *Tetramorium cæspitum* abounded on the grassy slopes leading to the beach. I took all the sexes of this, and also those of other ants, *Lasius flavus*, *niger*, and *alienus*—the two latter in close proximity, and, as I believe, in the same nest. Of *Myrmica* I could only find workers, and all were *lævinodis* or *scabrinodis*. This was a disappointment, as Smith had found *lobicornis* not uncommon in the neighbourhood. *Mutilla rufipes*, ♀, was fairly abundant, running by the sandy paths along the slope. *Tiphia femorata*, ♀, literally swarmed on the umbelliferous plants, but I found no males. Of the *Pompilidæ* by far the most abundant was *Priocnemis exaltatus*, both sexes. I also took *Pompilus plumbeus*, mostly in the "Denes" towards Corton, and females only of *Pompilus chalybeatus*, *unguicularis*, and *gibbus*. The local species of *Mellinus* (*sabulosus*) occurred in both sexes, but not in such abundance as I expected. But most of the fossorial genera seemed afraid to put in an appearance in the gusty and sometimes rainy weather which prevailed, and the few which did appear (such as *Tachytes* and some common sorts of *Crabro*) scarcely deserve a record. Wasps were not common, but I came across one or two specimens of *Odynerus trimarginatus*. Lastly, as to the Bees; not many species were to be found, but they included some rather good ones. *Andrena nigriceps*, ♀, was fairly abundant on the ragwort, and I also took a few males. I found, too, four kinds of *Colletes*—*succincta*, *fodiens*, *Daviesana*, and *picistigma*; of the latter, unfortunately, only females. On Corton Common the workers of *Bombus Scrimshiranus* abounded, revelling on the purple heath (I have since taken some males near Woking on the same flower). Other *Bombi* occurring frequently were *hortorum*, the males nearly all of the black variety *Harrisellus*, while the females and workers were, without exception, light in their colour; *Latreillellus*, and (workers only) *cognatus*. Of my other captures it may be worth while to mention *Epeolus productus*, *Sphecodes puncticeps*, *Cœlioxys elongata*, *Anthophora furcata*, *Andrena bimaculata*, and *Halictus punctatissimus*.—F. D. Morice, Rugby: *September 14th*, 1891.

Myrmosa melanocephala in Warwickshire.—On July 27th last I took a male of this species in my garden at Rugby. Never having seen any of the so-called "solitary ants" in this district, I was a good deal surprised at this capture, and I think it may be worth recording, as I am not aware that *Myrmosa* has been previously found in the Midlands.—Id.

Hemiptera-Heteroptera near Lowestoft.—Last summer I recorded the capture of *Nabis boops* at Gomshall; it has been my good fortune to meet with the insect again this year in Suffolk. In August I found a single specimen at the roots of the tall grass on the sandhills near Lowestoft; several hours' diligent search, however, failed to yield any others. The commonest *Nabis* there was *major*, which was abundant; but, owing to the lateness of the season, by the beginning of August they had not got beyond the nymph stage, and many were still quite minute larvæ. Four fully grown nymphs I enclosed in a box, hoping to see their transformation; but they soon attacked one another, and in a day or two there was but a single living one standing victorious amongst three corpses sucked dry. It was curious to note that to save itself the trouble of perforating the skin of its victims, the survivor availed itself of their anal opening in order to suck out their juices. This habit I have noticed in other cases also, and it gives them a means of attack which is successful even against hard skinned beetles. On the sands at Corton I found a macropterous ♀ of *Globiceps dispar* running about just above the margin of the sea. No others could be found in that neighbourhood, but at Fritton, about five miles inland, I came across the species plentifully in a marshy field covered with tall grass and rushes. They occurred at the roots of the vegetation, the females (brachypterous) being far more numerous than the males. The latter, like the same sex in *Cyrtorrhinus caricis*, were very agile, and readily took to the wing. One macropterous ♀ also fell to my lot here. I have a number of duplicates of the brachypterous ♀ which are at the service of any Hemipterists who may want the species. *Nabis lineatus* was fairly common in the same field, which also yielded a single specimen of *Cyrtorrhinus flaveolus* (macropt.). A few *Eroticoris rufescens* occurred at Lowestoft and Herringfleet, and a single *Salda orthochila* at the foot of the cliffs at Corton. But everything was late, and many species which are usually fully developed by August were still young and immature.—E. A. Butler, 39, Ashby Road, Crouch Hill, N. *September*, 1891.

Review.

A Synonymical Catalogue of the Lepidoptera Rhopalocera (Butterflies) of Australia: by W. H. Miskin, F.L.S., F.E.S. Forming No. 1 of the Annals of the Queensland Museum. Pp. 93, 8vo. Brisbane: J. C. Beal. 1891.

Mr. Miskin's name has been long and favourably known in connection with the *Lepidoptera* of Australia, and he has done good service in compiling this Catalogue. It is on the plan of Mr. W. F. Kirby's general Catalogue, but the "old fashioned" sequence from *Papilionidæ* to *Hesperidæ* is maintained. Especially valuable are the columns devoted to distribution, which give precisely the range of each species so far as is known. In some cases the author treats as "species" forms which are often considered as only varieties in a more general sense. About 360 species are listed, and naturally the northern (or inter-tropical) portion of the continent swells the list very considerably. A few new species are described for the first time. The bibliography and synonymy are very full, so much so as to be occasionally appalling in extent. With regard to generic nomenclature, the author says, "I have in many cases preferred to retain names, which have become so familiar by long use, as to make it inexpedient, in my opinion, to discard them," and he avows himself "an uncompromising opponent of the species makers," and says further, that "the practice of hastily describing as a new species an insect that the author has seen but a single example of, possessing no local knowledge of the fauna whence it is derived, is much to be deprecated." There is much good common sense shown in the Preface. Appended to the Catalogue is a Label List, "on one side only." Entomology is evidently progressing by rapid strides in our Australian Colonies, and nothing will tend to further it better than good faunistic Catalogues.

Obituary.

Edward Wesley Janson, F.E.S., died at his residence at Stroud Green, N., on September 14th, aged 69. For more than a year he had suffered from a painful and incurable internal malady, and had latterly been confined to his house. His family was of Dutch extraction, and his father was for a long time London Agent of the Dutch-Rhenish Railway Company, and in his office we believe the son acquired those precise business habits which were a feature in his character. He early showed a taste for entomology, and in 1843 joined the Entomological Society of London. At that time the Society possessed a collection, and in 1850 Mr. Janson was appointed Curator, and continued as such down to 1863. The Society's Collection was sold in 1863, and thenceforth the Curator became Librarian—a post held by Mr. Janson till 1874. He was one of the Secretaries from 1857 to 1861. Most unfortunately for himself and for the Society his peculiar temperament led to a serious split in the Society in 1862. All this time Mr. Janson was diligently collecting and studying the British *Coleoptera*, and did much and undoubtedly good work in an Order that was then comparatively little known, and to which the only guide was Stephens' "Manual." He went the right way to work, and entered into correspondence with the leading Continental authorities on *Coleoptera*, thereby clearing up many doubtful points, and adding largely to the number of known British species. He was a frequent contributor to the "Entomologist's Weekly Intelligencer," &c., and from 1855 to 1861 furnished the chapter on British *Coleoptera* to the "Entomologist's Annual." Here again his temperament unfortunately brought him into violent contact with his fellow workers, for our Coleopterists in those days were by no means a happy family. Subsequently Mr. Janson established himself as a Natural History Agent and Bookseller, and acquired a considerable business, in which he is succeeded by his surviving son Oliver, who is also favourably known as a writer on *Cetoniidæ*. Mr. Janson amassed a very large library, not only in the way of business, but also as a bibliophile, and he is believed to have possessed one of the finest collections of *Elateridæ* ever brought together, but he made but little use of it as a writer. As a Natural History Agent he did much, and often for the mere love of the thing, to enrich the collections of many of our prominent entomologists; the amiable side of his character strongly and favourably exhibited itself with the mellowness of age, and his death, under peculiarly painful circumstances, will be deeply regretted. In addition to his contributions to serials, Mr. Janson edited the Coleopterous portion of a new edition of Curtis' "British Entomology."

Societies.

Birmingham Entomological Society: *Aug. 17th*, 1891.—Mr. R. C. Bradley in the Chair.

Mr. G. W. Wynn showed bred series of *Bombyx rubi* and *B. quercus* from Sutton, a single specimen of *Chærocampa porcellus* taken at Sutton last June, a series of *Notodonta dictæa* bred from larvæ found on Cannock Chase; and a single specimen of *Plusia bractea* from Bewdley. Mr. P. W. Abbott showed series of *Zygæna filipendulæ* and *Z. trifolii* from the Isle of Wight, including yellow varieties of the former species. Of the latter species 75 per cent. were varieties, with the spots more or less coalesced. Mr. R. C. Bradley showed *Scatophaga scybalaria* from Sutton Park. Mr. C. J. Wainwright showed *Phytometra ænea* from Wyre Forest.—COLBRAN J. WAINWRIGHT, *Hon. Sec.*

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY: *September* 14*th*, 1891.—The Opening Meeting for the Winter Session.—The President, Mr. S. J. CAPPER, F.L.S., F.E.S., in the Chair.

Mr. Walker read a paper, entitled, "Nerves and Nervous Systems," describing the general structure of the nervous system of a typical insect, and comparing it with that of a spider, and pointing out the close affinity which differs only when the economy of the subject rendered it necessary. The paper was illustrated with carefully executed blackboard drawings. Among the numerous exhibits the President showed specimens of the new *Tortrix donelana*, from Galway. Mr. Walker, curious varieties of *Vanessa Antiopa*, which he had bred from Canada, the black sub-terminal band and the blue spots being quite absent, the yellow border very wide. Mr. Melvill, a specimen of *Chærocampa nerii*, captured at Prestwich in 1846. Mr. Newstead, several cases of life-histories, including the full life-history of *Sirex gigas*, which he stated had been very common. Mr. Prince, a fine variety of *A. Caja*, the fore-wings of which were almost quite brown, and the black spots on the hind-wings formed a thick dark marginal band. Mr. Gregson, a series of *Lithosia sericea*, taken this year. Mr. Harker, *Dianthæcia Barretti*, from Howth.—F. N. PIERCE, *Secretary*, 143, Smithdown Lane, Liverpool.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY: *August* 13*th*, 1891.—W. H. TUGWELL, Esq., President, in the Chair.

Mr. J. Jenner Weir exhibited the cases containing living larvæ of *Psyche villosella*, Och., the produce of the eggs in July of the present year; of last year, the cases from which the imagines had emerged from the eggs of 1889; and the perfect insects, male and female; and contributed notes thereon. Mr. Weir also exhibited a pair of *Pyrameis Dejeanii*, Godt., and remarked that it would be seen the male was scarcely, if at all, distinguishable from *Pyrameis cardui*; the female, on the other hand, resembling a faded *P. Atalanta*. Mr. Weir made some interesting observations relative to his exhibit. Mr. C. Fenn exhibited a female specimen of *Odonestis potatoria*, L., with male coloration, from Deal. Mr. J. H. Carpenter, a finely marked variety of *Epinephele hyperanthus*, L., the spots on the under-side being unusually large and elongated, a bred series of *Melitæa Athalia*, Rott., from Essex, and *Cucullia asteris*, Schiff., from Folkestone. Mr. West, *Apamea ophiogramma*, Esp., from his garden at Streatham. Mr. Watson also showed *A. ophiogramma*, and a small bred series of *Ocneria dispar*, L. Mr. C. A. Briggs, *Heliothis peltigera*, Schiff., dark forms from Devon, pale forms from Tuddenham, Norfolk, and Folkestone, Kent, and asked whether both forms had been taken together. Mr. Herbert Williams, an hermaphrodite of *Pieris rapæ*, L., taken at Box Hill. Mr.

Frohawk, a fine series of unusually large females of *Euchloë cardamines*, L., from Kent. Mr. Tugwell, *Dioryctria abietella*, Zinck., bred from Scotch-fir shoots, also dark varieties of *Pyralis farinalis*, L., and a streaked variety of *Botys urticalis*, Schiff. Mr. Hawes, living larvæ of *Syrichthus malvæ*, L., and *Nisoniades Tages*, L. —H. W. Barker, *Hon. Sec.*

Entomological Society of London: *September 2nd*, 1891.—Frederick DuCane Godman, Esq., M.A., F.R.S., President, in the Chair.

Mr. W. H. Blaber, of Groombridge, Sussex; Mr. T. D. A. Cockerell, F.Z.S., of Kingston, Jamaica; Mr. R. E. V. Hanson, B.A., of Tunbridge Wells, Kent; and Mr. R. C. Wroughton, of Poona, India; were elected Fellows of the Society.

Mr. G. F. Scott-Elliot exhibited a series of various species of *Diptera* collected on *Ranunculaceæ*, *Papareraceæ*, and *Cruciferæ*. He said that during the past summer he had studied about forty species of plants belonging to the Orders named, and that they had all been visited by insects which were probably necessary for nectariferous flowers. The majority of the *Diptera* caught were not confined to one species or even genus, but in view of the unmodified character of the flower in the Orders named this was only to be expected. Mr. Verrall observed that certain insects affected certain plants, but that the *Geraniaceæ* were seldom visited, except by a few *Empidæ*. The discussion was continued by Mr. McLachlan, Mr. Kirby, and others.

Mr. W. L. Distant exhibited a specimen of the Orthopterous insect, *Hemisaga hastata*, Sauss., which, in the Transvaal, he observed to attack and feed on *Danais Chrysippus*, a butterfly well known for its protective character and distasteful qualities to have a complete immunity from the usual Lepidopteral enemies. The *Hemisaga* lurked amongst the tops of tall flowering grasses, being consequently disguised by its protective resemblance to the same, and seized the *Danais* as it settled on the bloom. From close watching and observation Mr. Distant could discover no other danger to the life of this well-known and highly protected butterfly.

Mr. T. R. Billups exhibited four species of *Diptera*, which he believed to be respectively *Oxycera terminata*, Mg., *Pipizella annulata*, Mg., *Clidogastra punctipes*, Mg., and *Oxyphora arnicæ*, L., taken at Oxshott, Surrey, on July 11th last. He mentioned that all of them were recorded in Mr. Verrall's list only as "reputed British." He also exhibited a specimen of *Hypoderma bovis*, Deg., taken at Plumstead on the 29th July last.

Dr. D. Sharp exhibited several species of *Forficulidæ*, and called attention to the diverse conditions of the parts representing the wings in the apterous forms.

Mr. H. Goss exhibited living larvæ of *Scoria dealbata*, reared from ova. They were feeding on *Polygonum aviculare*, but not very freely; *Brachypodium sylvaticum* had been named as a food-plant for this species, but he did not find that the larvæ would eat this or any other grass.

The Rev. Dr. Walker exhibited, and read notes on, a collection of *Lepidoptera*, *Hymenoptera*, *Coleoptera*, *Neuroptera*, and *Diptera*, which he had recently made in Norway. Mr. Champion, Mr. Billups and Mr. McLachlan took part in the discussion which ensued.—H. Goss, *Hon. Sec.*

ENTOMOLOGICAL NOTES FROM PORT DARWIN, &c.

(*Continued*).

BY JAMES J. WALKER, R.N., F.L.S.

I have just returned from a little trip "up country," otherwise I should not have a great deal to record. The weather here, though still brilliantly fine, is now getting very hot, and the place is utterly parched up, though curiously enough, a few species of *Coleoptera* are putting in an appearance for the first time. *Lepidoptera* are nowhere now, though yesterday I got a good addition to the local list of butterflies (*Charaxes Sempronius*) on board the ship!

We left Port Darwin for our survey work on July 3rd, arriving at Baudin Island, our head quarters in those parts, on the evening of the 5th, where we found our tide-watching party all well, and unmolested by natives. On the 7th we moved to "Low Rocks," in Admiralty Gulf, where we remained until the 16th, making magnetic and other observations; I landed only once for a few hours, and got but one moth, singularly like *Zeuzera æsculi* (of this species I have since found the larvæ feeding in the large woody roots of a species of bean which grows on sandy shores). From the 16th to 19th sounding and surveying between Baudin and Troughton Islands, anchoring off the former Island until the 24th. I landed several times, and got a few nice insects and land shells, taking advantage of a lot of big stones being raised out of the ground on the summit to build a cairn; here I took two or three nice species of *Heteromera*, allied to *Helops* (mostly deep blue in colour), a curious flat, broad *Elater* of small size (not rare), a *Harpalus*-thing under dead leaves, &c. A fine shark, 9 feet long, was caught (and eaten) on the 19th; his back bone, laid to bleach on the sand above high-water mark, promptly attracted numerous examples of a beautiful blue *Saprinus*, of a *Dermestes*, like our *D. tessellatus*, and *Corynetes violaceus*, which latter beetle appears to be all over the world. A very fine *Bostrichus*, quite an inch long, was brought me from the neighbouring Condillac Island. Of butterflies there were but few, with the exception of a fine *Pieris* (I think a form of *P. Teutonia*), which was common and in good condition; I also found the larva feeding on *Capparis*, and bred a nice series.

On the 25th we moved down to Bigge Island, and cruised about there until the 29th, when we began to make our way back to Port Darwin; on that afternoon I was landed on one of the Montalivet Islands, of similar character to Baudin, but more rugged and rocky, where I got a few land shells but very little else, although there was no lack of vegetation, and even some good-sized trees. The 30th at Baudin again, where I got the afternoon ashore, but, the tide being low, I went in for collecting sea shells on the beach, or rather reef, and got a fair variety. August 1st, I landed at 10 a.m. with a survey party on "Jones' Island," and spent the day there very pleasantly. This is little more than a sand bank, about 1¼ mile in circumference at high water, but surrounded by a very extensive reef, which dries out at low tide for more than a mile all round ; the Island itself is covered with coarse grass and herbage, and in the centre is a large deposit of an inferior kind of guano, which had been worked at some previous period, as there were eight or ten large iron water tanks left there, besides numbers of broken shovels, &c., and some large heaps of the guano piled up ready to be carried away. The number of sea birds on the Island was astonishing, but unfortunately none were breeding at the time ; I picked up a few *Coleoptera (Harpalus, Opatrum, Corynetes,* &c.) and *Hymenoptera*, not to mention a couple of human crania, apparently those of aboriginals, but very old—they had been there quite 20 years I should say ; however, I thought them worth bringing off. No land shells, but a varied assortment of sea shells on the reef at low water ; it was 10 p.m. before we were able to leave the Island, on account of the tide, and the ship having moved out some eight miles, it was nearly 2 a.m. before we got on board again.

We left for Port Darwin on the following afternoon, and arrived there at 8 a.m. on the 6th. In the course of one or two walks on shore I saw exceedingly few insects on the move, only stray specimens of *Eurycus* and *Delias Aganippe*, which latter I failed to catch ; but I fell in with a few nice forms of *Coleoptera* for the first time at this place, chiefly under stones and logs in very dry places. Perhaps the most interesting was a Brenthid, almost a *fac simile* of *Amorphocephalus*, of which I found six examples under a piece of ironstone, in a nest of medium-sized red ants. Another "ant's nester," a little yellow species near *Coluocera*, but larger and more oval, occurred in large numbers with a very small black ant. One or two fine *Carabidæ* (notably a thing like a large *Pœcilus lepidus*, in plenty) were found under the stones, and a very nice Heteromeron (? *Toxicum* sp.), with two long horns on head in ♂, occurred under a log (I afterwards got a good many more up country). A *Hispa*, exceedingly like *H. atra* in all respects, a nice Langurid, and one or two very queer forms of *Hemiptera* were obtained by sweeping ; while a moderate-sized and deeply punctured black Heteromeron, probably a near ally of *Pandarus*, occurred under logs somewhat freely, along with one or two *Elateridæ*, &c.

On the 8th I started from Port Darwin on a week's leave, for a trip up the railway line, which extends about 150 miles into the interior to a place called "Pine Creek;" I was kindly furnished by the authorities with a 1st class pass to the end of the line, but after making due enquiries, I resolved to at least break the journey at the "Adelaide River" Station, 77 miles from Port Darwin, the presence of permanent water being a great inducement to me to stay there. I left at 8 a.m., and it was a somewhat monotonous ride through a flat or slightly undulating country, covered with the endless *Eucalyptus* forest, and diversified only by the huge nests of the *Termites*, some of which were fully 15 or 18 feet high; one very remarkable kind, seen in only one or two places along the line, being of a *thin, flat, wedge-shape*, about 5 feet high, and what is most singular, the long direction of the sides is invariably the same, viz., north and south. I greatly regretted that I had no opportunity of closely examining these remarkable nests, which I do not remember having seen any account of in all the books I have come across. Arriving at the Adelaide River soon after noon, I saw at once that it was the best place so far on the line, so having obtained good, though somewhat homely, accommodation, I stayed here until noon of the 12th. The river, which falls into the sea to the eastward of Port Darwin, about 120 miles from my position, consisted mainly of a series of deep pools of beautifully clear and pure water, connected by a shallow rapid stream flowing over a bed of coarse gravel; in the rainy season it reaches a level of more than 30 feet above the present one, as shown by the flood-rubbish entangled in the branches of the trees. A dense and luxuriant belt of bamboos, *Ficus*, etc., fringes both banks of the river, the surrounding country being as usual lightly timbered with *Eucalyptus*, *Pandanus*, *Casuarina*, *Grevillea* (the latter tree now leafless, but a mass of scarlet blossom, the resort of flocks of most noisy green and crimson parrots), and with long coarse grass underneath, very few flowers, except a few Compositæ. There were not many butterflies, though *Eurycus* was fairly common, and I got a pretty *Precis* new to me, one *Charaxes Sempronius*, one or two *Lycænæ* new to me, &c. Beetles were, I soon found, to be had by diligent working, and during my stay I must have got at least 150 species (I have already mounted over 100); the sweeping for about half-an-hour at sunset was very good, and I was astonished at the number of European, and even British, genera which turned up—varied of course by exotic-looking things, but not nearly to the degree which I should have imagined. Such things as *Bledius*, *Philonthus*, *Bembidium*, *Apion*, *Nanophyes?*, *Chilocorus* (blue sp.), *Hypocyptus*, *Hispa*, *Casnonia* (very nice sp.), *Trachys*, *Aphanisticus*, *Throscus* (very small sp.), *Crepidodera*, *Thyamis*, *Saprinus*, *Phalacrus*, *Coccinella*, *Epilachna?*, *Psammobius*, *Bryaxis*, *Mycetoporus*, *Anthocomus*, &c., &c., constantly turning up in the net. Under fig-tree bark, besides a fine grey Longicorn, I found plenty of *Hypoborus*, very like *H. ficus*, accompanied by a *Cerylon?*, and a thing not very unlike a small *Teredus*. Lots of *Coleoptera* (as well as moths) came to the lamp in the evening, chiefly small chafers allied to *Serica*, *Elmis?* (abundant), *Trox*, *Harpalus*, &c. In the pools along the bank of the river I got a very nice little lot of small water-beetles, all I think, with one exception, to be referred to European genera, the exception being a black *Volvulus?* in plenty; the chief things being *Gyrinus* (3 spp., one the smallest I had ever seen), *Agabus*, *Hyphydrus?*, *Hydroporus* (many, some very minute), *Hydrobius*, *Berosus*, *Cyclonotum*, *Hydrochus* (swarms), *Hydræna*, &c., also some interesting water-bugs near *Ranatra*, *Corixa*, *Plea*, &c. Most of my best captures, however, were made under logs and stones, within a quarter of a mile from where I was staying, close to the Railway Station; on the river bank I found *Oodes?*, *Chlænius*, *Dyschirius*, *Stenolophus*, *Clivina*, etc., and in drier situations 4 spp. of *Carenum* (unfortunately the two best, very fine green species, only singly), *Pœcilus*, *Harpalus* (several), a lot of a fine little Lucanid between *Passalus* and *Dorcus*, but, I think, nearer the former, several *Heteromera*, a fine and very curious black weevil near *Otiorhynchus*, &c., &c. In a nest of a large stinging ant I got four or five of the finest *Pselaphid* (near *Ctenistes*) I have ever seen; this made me hope to meet with one or other of the *Paussidæ*, but they did not put in an appearance. In stercores, several *Onthophagi* of small size (one nearly a *fac simile* of *O. taurus*), a fine blue *Saprinus*, &c. *Hemiptera* pretty numerous, including one or two very fine forms. *Hymenoptera* only tolerably represented. I took the finest *Æschna* I ever saw down by the river (where I resorted to bathe morning and evening), as well as some other interesting dragon flies, &c. *Diptera*, including mosquitoes, most abundant and troublesome, but no great variety.

I found the further I went away from the immediate neighbourhood of the river, the less there was to be had, so confined myself almost entirely to its banks, going perhaps over an extent of four or five miles only. Lots of natives, but all "tame," as the saying is here, and apparently not at all bad fellows, though burdened with a minimum of clothing. Altogether my stay at the Adelaide River was a very enjoyable and, I think, a fairly successful one, and should we come here next year, as seems not unlikely, I hope to be able to have a similar trip a little earlier in the season. On the 12th, at noon, I resumed my trip up the line to a place called "Union Reefs," about 140 miles up, where I had a kind invitation from the manager of some gold (quartz) mines. Arrived there at 4.20, after a somewhat tedious journey through a very arid country, timbered with the usual *Eucalyptus*, &c. (no place anywhere to compare with the one which I had just left), I had just time to look over the operations for crushing the quartz and extracting the gold by means of mercury (which operations are very interesting) before it was dark, and being very tired, turned in early. Next morning, as I had to start back to Port Darwin at 8.20, I roused out at 6 a.m. (sunrise), and got an hour's collecting before breakfast; the country was miserably arid, but I got one or two nice fresh *Carabidæ*, *Heteromera*, weevils, &c., but mostly single specimens. It was a long and very hot ride back to Port Darwin, where I arrived at 4.30 p.m., but I greatly enjoyed the few days out of the ship, the results of which have kept me busy ever since. Have been out once or twice collecting since my return, and keep finding a few additions each time; *Pœcilus?* sp.? now swarms under nearly every big log or stone, but you never see one anywhere else; one or two other nice *Carabidæ*, &c., turn up occasionally with it.

H.M.S. "Penguin," Port Darwin:
August 17th, 1890.

NOTE ON THREE AUSTRALIAN *CARABIDÆ*.

BY H. W. BATES F.R.S.

The three interesting species here mentioned formed part of a small series of Australian species sent to me for determination, some time ago, by Mr. A. S. Olliff, of Sydney. The new genus of the *Broscus* group is interesting as being closely allied to a genus, *Lychnus*, hitherto known only from Tasmania, and as adding another generic form to the numerous and varied Australasian series of this sub-family.

EURYLYCHNUS, *nov. gen.*, sub-fam. BROSCINÆ.

Of shorter form than the typical *Broscinæ*, the elytra especially briefly oblong-ovate. Head small, strongly sulcate-constricted immediately behind the prominent eyes; frontal furrows deep, lateral, and the groove and ridge close to the eye and over the base of the antennæ sharply developed. Antennæ short, joints 4—11 ovate, contracted at their bases, joints 1—4 (except apex of the 4th) glabrous. Terminal joints of the palpi gradually dilated and compressed to the apex, and broadly truncated, the labials more strongly so, with bisetose penultimate joint. Mandibles furnished with a setigerous pore. Thorax suborbicular, as wide as the elytra, the latter without scutellar striole. Joints 1—3 of the anterior tarsi, with their outer angles produced, in the ♂ more strongly so, and their soles on the inner side furnished with a rounded pad of compact hairs.

The genus is nearest allied to *Lychnus* (Putz.), but clearly distinct by the form of the anterior tarsal joints, and the clothing of the soles in the ♂.

EURYLYCHNUS OLLIFFI, *n. sp.*

Shining pitchy-black, the palpi, antennæ, and legs dark red. The transverse occipital groove punctured, the rest smooth. The thorax strongly rounded on the sides, but a little narrower at the base than between the prominent but rounded anterior angles, and suddenly narrowed close to the base, whereby the hind angles become slightly projecting; the base with a few large punctures, the dorsal furrow deep, the rest smooth. Elytra towards the suture sharply striated, the exterior striæ and all striæ near the apex obsolete. Long., 13 mm., ♂ ♀.

Mt. Kosciusko, N. S. Wales.

PERCOSOMA BLAGRAVII,

Putzeys, Stett. Ent. Zeit., 1868, p. 323; *Mecodema Blagravii*, Castelnau, Trans. R. S. Victoria (2), vol. viii, p. 161.

This species, of which Mr. Olliff has sent me a single (apparently female) example, certainly cannot remain in the genus to which M. Putzeys has referred it. The head is of entirely different form, strangulated (though not so strongly as in *Lychnus*) immediately behind the eyes, the neck not broader than the anterior part, the eyes prominent, the frontal furrows deep and lateral, and the mandibles short and broad, and abruptly falcate at the tip. As in the *Broscidæ* generally, it has only one supra-orbital pore, whereas *Percosoma* has four in line close together. The first three joints of the anterior tarsi are greatly prolonged at their outer apices, and the palpi dilated and transversely truncated, the labials subsecuriform. If the male prove to have the soles of the dilated joints of the anterior tarsi furnished with a hair-pad, the species will belong to *Eurylychnus*, from which it differs only in the elytra having a scutellar striole.

Mt. Kosciusko.

GIGADEMA GRANDIS,

Macleay, Tr. Ent. Soc. N. S. Wales, i, p. 108; Chaudoir, Rev. et Mag. Zool., 172, p. 20.

Neither of the above-cited descriptions of this fine species is satisfactory; Chaudoir's minute details of the elytral sculpture do not agree with any of the ten examples, males and females, which I have examined, and which include specimens named by Macleay himself. The species is distinguished from *G. titana*, *longipennis*, *Bostocki*, and others, by the rotundity of the sides of the thorax continuing to behind the middle, by the sub-opaque elytra, and by the broad lobular production of the middle of the anterior margin of the thorax. This process is most developed in the ♂, in the ♀ it is sometimes very much reduced, the front margin being nearly straight from one angle to the other. Specimens of this latter form were sent to England some years ago by Mr. Masters, under the name of *G. noctis* (Newman), and one, somewhat intermediate, was included among the species communicated by Mr. Olliff. What may be the *G. noctis* of Newman I have failed to ascertain, for although Chaudoir alludes to the insufficient description, neither Mr. Waterhouse nor myself can find any species under this name in Newman's works; there is, however, a specimen labelled in Newman's handwriting, correctly placed among the series of *G. titana*, Thomson, in the British Museum collection, and this may have led to some inexplicable mistake regarding it; Chaudoir gave it, with doubt, as a synonym of *longipennis*, Germ., but confused the matter by confounding this species with the much larger and very different *G. titana*.

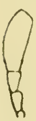
Queensland.

11, Carleton Road, Tufnell Park, N.:
October, 1891.

THE SEXUAL CHARACTERS IN THE PALPI OF *MORDELLISTENA ABDOMINALIS*, FABR.

BY G. C. CHAMPION, F.Z.S.

The apical joint of the maxillary palpi of *Mordellistena abdominalis*, Fabr., is exceedingly dissimilar in form in the two sexes, and this important character seems to have been entirely overlooked by authors. In the male (fig. 1) this joint is about three times as broad as long, deeply excavate along the upper side within, and has the upper and lower sides sub-parallel, the tip rounded, and the base sub-truncate; it may be described as boat- (or hammer-) shaped. In the female (fig. 2), it is oblong-ovate, rather narrow, with the apex obtuse. The three apical joints of the maxillary palpi may be easily seen without dissection, if the insect is mounted in the "English fashion;" and it seems inexplicable that these characters have not been noticed before, the species being one of the best known, and at the same time the most interesting, of the genus *Mordellistena*. Mulsant, who devotes three entire pages to his description of the species (Longipèdes, pp. 53—55), does not mention the form of the palpi. Emery, though he proposed a sub-genus, *Mordellochroa*, for *M. abdominalis* and another species (Essai Monogr. sur les Mordellides, p. 80), is equally silent as regards the form of the palpi: he merely gives as characters for his sub-genus, "Eperons des jambes de la 2^{e} paire presque nuls, à peine visibles; prothorax d'un rouge vif, au moins chez la ♀; élytres noires unicolores;" nevertheless (*op. cit.*), in three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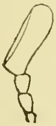
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small, less known species, *M. Tournieri*, Emery, *M. humerosa*, Rosenh., and *M. pulchella*, Muls., all belonging to his section *Tolida*, he observed similar but less pronounced sexual characters of this kind, and particularly notices the malleiform apical joint of the male. Thomson (Skand. Col., vi, p. 295) notices a sexual difference in the palpi, but, as will be seen from the accompanying figures, his description is incorrect and misleading as regards both sexes: of the male he states, "palpis maxillaribus articulo ultimo securiformi," of the female, "palpis maxillaribus articulo ultimo oblongo subsecuriformi;" he mentions, however, that the exterior margin of the joint is excavate in the male. Jacquelin-Duval (Gen. Col. Europ., iii, pp. 405, 406, t. 90) describes and figures the trophi of *Tomoxia*, *Mordella*, &c., but he says nothing about *Mordellistena*; Lacordaire, also (Gen. Col. v, p. 611), omits all reference to these sexual characters. Curtis, Brit. Ent., ii, Col. ii, figures the mouth-parts, &c., of *M. abdominalis*, and also the insect itself, on t. 483, but the apical joint of the maxillary palpi (which he describes as large, ovate, hatchet-shaped) is incorrectly drawn; his figures and description refer to the female sex only, though he was unaware of the fact. Fowler (Col. Brit., v, pp. 70, 71), not having examples of both sexes of *M. abdominalis* before him for examination, has taken his characters from Thomson. The species itself is somewhat rare in Britain, but I have taken examples of both sexes occasionally on *Umbelliferæ* in early summer, at Caterham and Mickleham in Surrey, and at Darenth Wood and Strood in Kent; the male is very much rarer than the female. As is well known, the sexes differ considerably in colour, the male having been described by Fabricius under the name of *M. ventralis*, and the female by the same author as *M. abdominalis*.

I have recently described (Biol. Centr.-Am., Col., iv, 2, pp. 310, 311) three species of *Mordellistena*, of large size, from Central America, *M. ephippiata*, *M. lineatocollis*, and *M. æquinoctialis*, with the palpi formed in both sexes as in *M. abdominalis*, Fabr.; and also several small species, *M. palpalis*, *M. perexigua*, &c. (*op. cit.*, pp. 347, 348), with the palpi as in the above-mentioned South European forms included in *Tolida* by Emery. In the other British species of *Mordellistena*, the apical joint of the maxillary palpi is not very dissimilar in form in the two sexes, it being, at most, a little longer and more triangular in the male than in the female; the section *Tolida* is not represented in Britain.

11, Caldervale Road, Clapham Common, S.W.:
October 1*st*, 1891.

NOTES ON THE BRITISH SPECIES OF *HALTICA*.

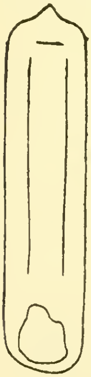
BY JAMES EDWARDS, F.E.S.

The following notes are nothing more than the result of an attempt to furnish an intelligible definition of the species of *Haltica* known to inhabit Great Britain. The subject is for many reasons one of more than ordinary difficulty, and I am bound to admit that my success has been scarcely so complete as I could wish; but as I have been fortunate enough to enjoy special facilities for the investigation of the matter, I think it well to publish a statement of the conclusions at which I have arrived.

A considerable quantity of material has been placed at my disposal by Mr. Champion, Dr. Sharp, and others; and I am, in particular, indebted to the Rev. Canon Fowler for the loan of the actual specimens referred to in his "Col. Brit. Islands," with the labels of the continental authorities still attached, and to Mr. P. B. Mason for the loan of the Rye and Wilkinson collections.

The difficulties which attend any attempt at the effective definition of the species of this genus have long been recognised, and are chiefly owing to the fact that the points upon which we are accustomed to rely for specific differences are subject to so much variation as to be in most cases practically worthless as characters of limitation. Fortunately, the form of the *œdeagus* affords constant structural differences, and it seems to me that the character next in importance in point of practical value is that of the general facies. It must not, however, be assumed that I dismiss the various characters which have been employed for the separation of species here (and which look so well on paper) without sufficient reason; on the contrary, I have spared no pains in testing the utility of them all. The presence of three or four teeth to the mandibles has been used to divide the species into two groups, but the fact is that the mandibles are trifid at the apex in all, the so-called fourth tooth being simply an angular projection, of greater or less development, on the inner edge of the upper-side of the mandible; it is true that this projection is more apparent in the smaller species, but the variation in its development frequently leaves one in doubt whether the individual specimen under examination should be regarded as having three teeth to its mandibles or four. Another very variable character is the callosity at the anterior angles of the thorax; it is present in all, but reaches its greatest development in *H. lythri*. Equally unsatisfactory are the characters derived from the humeral callosity of the elytra, the frontal tubercles, and the punctuation: the punctuation of the elytra is really the same throughout the genus; the surface of the elytron is finely reticulate, and the punctuation consists of large punctures with an admixture of smaller ones. With the exception of those derived from the *ædeagus,* all the characters before mentioned are liable to a surprising amount of variation in degree, and this is quite independent of sex or species; more than this, monstrous individuals frequently occur which, by reason of the accentuation of some character, differ completely in appearance from any of their congeners, and as these specimens are generally females, it is impossible to say with certainty to which species they should be referred. I have two such specimens now before me; one with distinctly projecting anterior angles to its transversely quadrate thorax, which seems to belong to *H. lythri*, the other, in which the thorax is little, if anything, more than one-half as wide as the base of the elytra, seems to belong to *H. oleracea.* Under these circumstances, it is not surprising that the nomenclature of these insects is in a state of hopeless confusion, but it is clear that the present is not an occasion for any attempt to deal exhaustively with the literature of the group, and for that reason I do not in the matter of names propose to go behind the account of the genus given by Weise, in "Ins. Deutsch.," vol. vi, pt. v, p. 825, *et seq.*

The *ædeagus*, which is formed on the same general plan throughout the genus, is a straight, elongate, parallel-sided, chitinous organ, arising from a short oblique base, and having a length in its straight part about equal to four times its width; its general contour and proportions may be gathered from the accompanying figures, of which A represents the under surface of the organ in *H. lythri*, and B the same part in *H. oleracea.* Its upper surface is mainly occupied by an elongate-triangular excavation, furnished in its basal two-thirds with numerous transverse ridges, and having at the apex an orifice from which the *ductus ejaculatorius* is extruded; the under surface, which furnishes the most useful specific characters, may be considered as divided longitudinally into three tracts, namely, a wide and flat smooth central channel, flanked on each side by a somewhat raised lateral tract; these lateral tracts become depressed or excavated, or otherwise altered in form, in their apical third, and are furnished at about their middle third with a series of deeply engraved short oblique lines; the number and disposition of these lines (*i. e.*, whether the series extends to the base of the *ædeagus* or not), is not, in the species that I have examined, a matter of any value as a distinctive character. The *ædeagus* of *H. oleracea*, L., forms an exception to the foregoing observations, as its apex is rounded instead of apiculate, and the under surface is divided into five tracts, having a lateral channel at each side margin, in addition to the central channel, with its contiguous raised lateral tracts.



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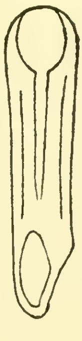

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The characters drawn from the *ædeagus*, of which I have availed myself in this paper, are only those which are well-defined, and readily appreciable; for, after some experience of the matter, I think that many of the minute differences employed by Weise in his table of characters drawn from the *ædeagus* are rather those of the individual than of the complex. So far as our British species are concerned, if one had a number of the *ædeagi* under review, it would be easy to pick out those of *H. pusilla*, *oleracea*, and *coryli*; but with regard to the others, they are all apiculate, and have the lateral tracts of the under-side flattened and longitudinally excavate in the apical third, so that, in spite of certain minor differences of degree, they cannot be separated with any approach to certainty.

In the males the basal joint of the front and intermediate tarsi is widened, particularly the former; the last ventral segment is flattened in the middle, and narrowly reflexed at the apex, and its hind margin is feebly concave, with a large transversely oblong projection in the middle.

The following is a tabular expression of the characters which I have found most useful for the separation of our species:—

1 (6) Elytra distinctly widened behind, or parallel-sided.

2 (5) Elytra attaining their greatest width about the apical third.

3 (4) *Ædeagus* apiculate, the lateral tracts of the under-side flattened, but not longitudinally excavated in the apical third. Species bright metallic-green, living on hazel.................................1. CORYLI, All.
ampelophaga, Brit. Coll.

4 (3) *Ædeagus* apiculate, the lateral tracts of the under-side flattened, and longitudinally excavated in the apical third. Species living on herbs in marshy places; colour violet-blue, or dark blue, more rarely blue-green or green...
2. LYTHRI, Aubé.
consobrina, Brit. Coll.
tamaricis, Fowler, *nec* Schr.

5 (2) Elytra parallel-sided for the greater part of their length. Colour blue-green, green, dull coppery or fusco-æneous. *Ædeagus* apiculate, the lateral tracts flattened, and longitudinally excavated in the apical third. Species living on heaths ....3. ERICETI, All.
longicollis, Brit. Coll. (♂).

6 (1) Body oblong-ovate, attaining its greatest width at or near the middle.

7 (8) Species dark blue, elytra strongly punctured...4. PALUSTRIS, Weise.
helianthemi, Brit. Coll.

8 (7) Species dark greenish-blue, dark green, or nearly black, punctuation of elytra finer and less evident.

9 (10) *Ædeagus* apiculate, the lateral tracts abruptly narrowed in their apical third, where the central channel widens out into a spoon-shaped depression. Average size smaller. Elytra proportionately shorter and wider...
5. PUSILLA, Dufts.
montana, Brit. Coll.

10 (9) *Ædeagus* rounded at apex, its under surface with three longitudinal channels, lateral tracts subterete for three-fourths of their length, the apical fourth forming a thin curved ridge. Average size larger. Elytra proportionately longer and narrower ....6. OLERACEA, Lin.
pusilla, Brit. Coll.

H. CORYLI, All.—This is our well-known, bright metallic-green, hazel-frequenting species; I retain Allard's name for this insect, notwithstanding that Weise puts it as a var. of *H. quercetorum*, Foudr. (distinguished therefrom by the want of a lateral fold on the elytra), because it has long been known to us under the name of *coryli*, which is, moreover, very appropriate. It is also the insect described by Fowler (Col. Brit. Islands, iv, 358), under the name of *ampelophaga*, Guér.; his opinion that all our specimens (presumably of the insect described by him) must be referred to *H. oleracea*, apparently arises from the fact that a pair of specimens standing under the name of *ampelophaga* in Dr. Power's collection, and labelled *oleracea* by Reitter, undoubtedly belong to the species so long known to us as *H. coryli*, and have nothing to do with *H. oleracea*, L., as understood and defined by Weise. The widening of the elytra behind is more distinct in the females than in the males, but the species can scarcely be confounded with anything but *ericeti*, from which it may be easily distinguished by its habitat, and its distinctly depressed form. There are several European species of a bright metallic-green colour, but the form of the *œdeagus* would serve to distinguish them. The true *ampelophaga*, Guér., which, according to Weise, = *consobrina*, Foudr, may, perhaps, be found here some day, since the latter author's insect is found on sallows, particularly on dwarf sallows, as well as on the vine.

H. LYTHRI, Aubé.—This is the *H. consobrina* of our collections; in form it is (normally) even more depressed and widened behind than *H. coryli*; in colour dark blue, with a greater tendency to acquire a violet than a greenish tinge, and the punctuation is, as a rule, very fine. Blue-green examples of this species a trifle more convex in appearance, and having the punctuation a little more evident than usual are the *tamaricis* of Fowler, but not of Schrank. After a careful examination of thirteen specimens of this kind (twelve ♀, one ♂), I cannot discover any satisfactory character or characters by which to separate them from *H. lythri*; the form of the *œdeagus* is practically the same as in that species. In defining *H. tamaricis*, Schr., Weise makes a great point of its narrow thorax, which he says is about half as wide as the elytra at the shoulders: of course, one does not expect mathematical precision in comparative measurements of this kind, but, of the four specimens from Dr. Power's collection lent to me by Fowler, not one has even the appearance of possessing an abnormally narrow thorax; one of these specimens, labelled *tamaricis* by Reitter, measures ·07 in. across the base of the thorax, and ·09 in. across the shoulders of the elytra, and exactly the same relative proportions obtain in the other three, although in one of them the measurements are ·06 in. and .08 in. respectively. Weise records *H. tamaricis*, Schr., as inhabiting England; apparently on the assumption that Stephens' *Haltica erucæ* is synonymous. He also tells us that *tamaricis*, Schr., is synonymous with the *hippophaes* of Foudras, and as the latter lives on *Hippophaë rhamnoides*, L., it may possibly yet be found in Britain on that plant, if not on *Tamarix gallica*, L., a plant common enough on our sandy coasts, although not indigenous.

H. ERICETI, All.—This is a convex, parallel-sided species, generally blue-green or green in colour, which sometimes swarms on *Calluna* and *Erica*; it is not, however, the only species which occurs on *Erica*, for on the only occasion that I have yet found *H. oleracea*, L., in quantity it was on *Erica tetralix* on Mousehold Heath.

The males have a particularly oblong appearance, and the widening of the basal joint of the front tarsi reaches its maximum of development in certain examples of this species. These accentuated males form the *H. longicollis* of British collections, whatever the *H. longicollis* of Allard may be (Weise puts the latter as a var. of *oleracea*, L.). The differences in punctuation which the late Mr. Rye (Ent. Mo. Mag., xii, 179) ascribed to *longicollis* and *ericeti* do not exist, and it is somewhat remarkable that all his specimens standing under the latter name are females, and those standing under the former name are, with one exception, all males. Copper-coloured or fusco-æneous specimens are occasionally found, especially in the north, and it is one of the latter which has been named *oleracea*, var. *nigra*, by Reitter, for Fowler, and is figured by the latter under that name (Col. Brit. Islands, iv, pl. 136, fig. 13).

H. PALUSTRIS, Weise.—In the entire absence of male specimens, I can only say that this species is to be distinguished from *oleracea* and *pusilla* by its very dark blue colour, and more evident punctuation; it stands in most collections under the name of *helianthemi*, All., and the dearth of males is, therefore, very remarkable. Dr. Sharp is of opinion that the males of this species do not have the basal joint of the tarsi dilated, but I have failed to find a male in his series of fifteen examples. The specimens are very uniform in size, and in colour most nearly resemble *H. lythri*. The late Mr. Rye, writing of this species (Ent. Mo. Mag., xii, 179), says that he was indebted to Mr. Chappell for the only male which he had seen, of which the intromittent organ differed very much from that of *oleracea* and *montana* (*i. e.*, *pusilla*, Dufts.); this identical male is now before me, and the *ædeagus* is dissected out, but, unfortunately, it is unmistakeably that of *oleracea*, L.; as there mounted it certainly differs very much from that of *oleracea*, as exhibited in the same collection, but the difference is entirely owing to the fact that they are so mounted that the upper surface of the one is compared with the under surface of the other; on dismounting the *ædeagus* of the so-called *helianthemi* and comparing its under surface with that of the ready-mounted *ædeagus* of *oleracea*, I found them to be identical in form; the specimen, moreover, is a perfectly normal *oleracea* in appearance, and is quite unlike the six female specimens of typical *helianthemi* (*i. e.*, *palustris*, Weise), which accompany it. Mr. Rye's male was named by Allard himself, but Weise puts that author's *helianthemi* as a synonym of *pusilla*, Dufts. Dr. Sharp, who has long had our insect separated in his collection as a new species, informs me that it generally occurs by single specimens, and this is my experience of the species in the field; it is found in marshy places.

H. OLERACEA, L., and PUSILLA, Dufts., are only to be determined with certainty by a reference to the form of the *ædeagus*, although, speaking generally, the latter may be distinguished by its smaller size, and comparatively wider and shorter elytra, the latter having a very broad square appearance at the shoulders; in colour both species are very variable, being indifferently green, greenish-blue, greenish-black, or black; the variety of the former with greenish-blue elytra and metallic-green thorax is a very handsome insect. In dealing with the English literature of these insects it is necessary to bear in mind that the names *oleracea* and *pusilla* have at different times both been applied to the insect here called *oleracea*, L. *H. pusilla*, as above defined, is the insect which was introduced into our lists as *H. montana*, Foudr , which latter is, according to Weise, merely a colour variety of the older *pusilla* of Duftschmidt; it stands under the name *montana* in the collections of Mr. Rye and Dr. Sharp, but of two specimens sent under that name by Canon Fowler one certainly is *oleracea*, L.; Dr. Sharp has taken the species on the Malvern Hills and at Mickleham, in August and September respectively, and also, quite recently, near Cambridge, where he found it exclusively confined to *Helianthemum*, and just emerging on September 3rd.

131, Rupert Street, Norwich:
September 10*th*, 1891.

FURTHER REMARKS ON THE GENUS *EUGASTER*, SERVILLE (*ORTHOPTERA—HETRODIDÆ*), WITH DESCRIPTIONS OF TWO NEW SPECIES.

BY W. F. KIRBY, F.L.S., F.E.S.,

Assistant in Zoological Department, British Museum (Natural History), S. Kensington.

Since my remarks on *E. spinulosus*, Linn., were published (*anteà* pp. 210, 211), Dr. Sharp has kindly presented a male *Eugaster* to the Museum, which so much resembles *E. spinulosus*, except in size and in the colour of the pale markings, that I should have regarded it as the true male (which I believe is still unknown), but that Dr. Sharp informs me that he possesses a female which does not differ from the male, except in the sexual characters.

EUGASTER POWYSI, Sharp, MS.

Head and pronotum testaceous; head above the antennæ black, reticulate-punctate, frontal tubercle small, obtuse; clypeus tawny, smooth, with scattered punctures, most numerous on the sides, which are slightly blotched with black; antennæ red for the basal third, and black beyond; mouth parts mostly blackish; mandibles broad, tawny, with a deep groove on the outer side; palpi black towards the tips; pronotum tawny, with black spines, with one longitudinal and two broader but shallower transverse depressions. Front edge with a series of small spines, about five on each side of the median line, diminishing in size to the centre; lateral spines five, the 2nd and 3rd much the largest; the intermediate space of the pronotum is very rugose, and crossed by irregular rows of black humps between each pair of lateral spines; the spaces between these humps are marked with deep punctures. Hinder lobes more reddish, raised, with eight or nine large spines on each side, diminishing to the centre. Above the front coxæ is a strong black spine; prosternum tawny, armed with two short concolorous spines, rather wide apart; in front of the coxæ is a large black spot on each side. Legs tawny, the extremities of the femora, the tarsi, and the front tibiæ, black; base of the femora spotted with black on the sides; all the tibiæ armed with four or five small spines beneath. Abdomen black, smooth and shining, with numerous red spots and dots, largest and most numerous at the extremities of the segments. Long. corp., 30 mm.

Hab.: Morocco.

EUGASTER SPINULOSUS, Linn.

The female specimen of *E. spinulosus*, Linn., in the Museum, which agrees very well with Edwards' figure (Gleanings, ii, pl. 285), looks very different to *E. Powysi*, owing to its large size (length, 51 mm.), the greater extension of the black markings on the pronotum (the whole of the hinder ridge is black), and the tawny markings of the abdomen; but in all other particulars it closely resembles *E. Powysi.*

I am not sure if it has already been pointed out that *Hetrodes spinulosus*, Fisch., Orth. Ross., p. 369, pl. xxxiv, fig. 2 (1834), is a true *Hetrodes*, and not a *Eugaster*; in fact, it is closely allied to, if not identical with, *H. pupus*, L. *E. Guyoni*, Serv., is the type of *Eugaster*.

EUGASTER GUYONI, Serv.

In alluding to this species in my former paper, I spoke of it as uniformly black, but this is not quite correct, for there are small and inconspicuous tawny or reddish dots and speckles on the base and sides of the abdomen, and sometimes also on the back; but nothing like so well marked, at least in any of our specimens, as in Lucas' figure (Expl. Alg. Orth., pl. ii, fig. 1).

There are four specimens of *E. Guyoni* in the Museum at present, all males, which were brought from Biskra Bay by Dr. Anderson, and vary very little.

They are from 27 to 30 mm. in length, and none of them show a fourth small spine, as described by Serville, behind the three lateral ones, though some of them have a small rudimentary spine on one side, either in front of the smaller spine which precedes the two large ones, or on the front edge of the pronotum. Perhaps the normal number of lateral spines in the male is three. Lucas states that the specimen described by Serville, and figured by himself, was a female, measuring 39 lines in length, and therefore considerably larger than the males in the Museum collection.

There is one female *Eugaster* in the Museum, previously referred to *E. Guyoni*, which was taken at Dartford, and was believed to have been brought from Tunis with Esparto grass, but it appears to me to belong to a distinct species.

EUGASTER LUCASI, *sp. n.*

Hetrodes Guyoni, var., Luc., Bull. Soc. Ent. France (2), ix, p. iv (1851).
Eugaster Guyoni, Luc., Ann. Soc. Ent. France (4), i, p. 217 (1861).
Eugaster Guyoni, White, Proc. Ent. Soc. Lond., 1888, p. xxv.

Deep black, slightly inclining to blue-black above; mouth-parts and trochanters inclining to reddish; spines red. Face smooth, sparingly punctured; mandibles with a deep groove on the outer side; vertex very thickly punctured; pronotum strongly rugose-punctate, with four spines in the lateral series, which are broad short, and hardly pointed ; there are also one or two smaller ones slightly indicated on the right side of the front of the pronotum. The two middle spines are very broad, rather short, the first of these is oblique and very slightly pointed, the second is rounded at the extremity. The first and fourth spines are smaller, and on a lower level, and the fourth is conical, being rather longer and narrower than the first. Prosternum black, with short red-tipped spines between the front coxæ, and above the front coxæ is a strong black spine. The hinder ridge of the pronotum is armed with four or five spines on each side, diminishing in size towards the centre ; the ridge itself and all the red spines are of a much darker red than in our specimens of *E. Guyoni.* Abdomen black, smooth and shining, the basal sutures and the anal appendages inclining to reddish, but without a trace of red or tawny dots or spots. Front and middle tibiæ armed with four, and hind tibiæ with five, spines on each carina. Long. corp., 39 mm. (62, sec. Lucas).

Hab. : Tunis (?).

I have little doubt that this insect is quite distinct from *E. Guyoni.* It is probably the same as that mentioned by Lucas as occurring in the south-east of Algeria, at Kefoum-Teboul on the Tanisian frontier, but his specimens appear to have been even larger than *E. spinulosus.*

British Museum (Natural History) :
September, 1891.

LIFE-HISTORY OF *HYPSIPETES RUBERATA.*

BY NELSON M. RICHARDSON, B.A., F.E.S.

On June 9th, 1888, I took a ♀ *H. ruberata*, which I put in an inverted bell-glass containing a sprig of sallow in water, and covered with leno. In the course of two or three days it had laid on the upper-side of the leno, by protruding its ovipositor through the holes, about 90 eggs. In the case of a ♀ taken last May the eggs were chiefly laid on the central stalk of a female sallow catkin, which would seem to be the natural laying place of this species, as it was also utilized by a ♀ which my friend, Mr. H. W. Vivian, bred from some pupæ I gave him in 1889.

The egg is oval in shape, generally a little broader at one end than the other. The top and bottom are rather flattened, so that the height of the egg is nearly the same all over, except close to the sides, which are consequently rather straight. The whole surface is covered with small irregular depressions, generally hexagonal, pentagonal or oval, of which there would be about 30 along the edge of a median transverse section. The egg is whitish when first laid, and after a day or two becomes pinkish in tinge, the ridges between the depressions being here and there marked with blotches of darker pink, which increases the general pink tinge when the egg is seen with the naked eye.

The larva, when first hatched, is remarkably lively, crawling very fast; it is difficult to keep in confinement, as it seems to be able to get out of almost anything; after a day or two, however, it settles down to its food (sallow), and gives no more trouble. It seems to like best the under-side of a sallow leaf, especially of a stipule, as a place of residence, spinning thereon a white silken covering for itself, on the outside of which it sticks the down from the leaf, thereby making its abode very inconspicuous. In its earlier days it is gregarious in its habits, several larvæ living under one covering; as it grows older it becomes more solitary, though, even up to the time of its being full-fed, two will often inhabit the same house. In its older stages it generally draws two leaves together and lives between them, or sometimes makes its home by folding over a part of a leaf. It rests with its head curled round to its tail, and it is remarkable how small an abode one or two good sized larvæ seem to find comfortable. At night it sallies out and feeds upon its own or the neighbouring leaves, but not on the part it has spun over. It remains nearly full-fed for a very long time before it forms its cocoon; most of my brood appeared to be full-fed early in September, and on October 25th there were still some that had not spun up for pupation. The larva descends to the surface of the ground about the middle of October and there spins a tough cocoon of silk mixed with small pieces of earth and rubbish, in which it shortly turns to a pupa. In one or two cases the larva spun up and turned between the sallow leaves, but this was not at all of frequent occurrence.

When quite young the larva is rather transparent, pale greenish, with a ringed appearance, owing to a very distinct dull red transverse band on the back of each segment, and with a dark brown head and plate on second segment, which become lighter with successive changes of skin. The markings on the body become less defined at each change, and gradually more marbled with ochreous, the red bands soon losing their definite outline, and becoming more suffused over the whole segment, except the folds where the segments unite, which remain green.

The description of the larva in its last stage is as follows:—Length about one inch; rather stout, tapering very slightly towards the extremities. The head is rather flat, the rest of the body nearly cylindrical. There is a rather striking oblique fold on the side of each segment in the neighbourhood of the spiracles, and the whole body has a somewhat wrinkled appearance. Head brown, much speckled and blotched with darker brown, clypeus and mandibles dark brown; 2nd segment with a shining, very pale ochreous, dorsal plate, marked with brown, and having a broad darker brown dorsal band extending to the subdorsal lines; body verdigris-green, marbled with dingy ochreous, and more or less suffused with pink, sometimes almost crimson, the green often entirely disappearing, except between the segments; 11th, 12th and 13th segments more entirely ochreous, the latter having a shining ochreous anal plate, generally slightly dotted with black; a similar plate extends over the whole of the hinder half of the anal clasper down to the foot; the dorsal, subdorsal and two other lines above, and one just below the spiracles are greyish, and rather darker than the ground colour, the line immediately above the spiracles very distinct and blackish on segments 2, 3 and 4, the dorsal line also being more distinct than the rest. Spiracles black, small, but distinct; legs marked with pale brown, and having a double, narrow, black mark in front where they join the body; claspers pale ochreous, hooklets reddish-brown; under-side of body pale ochreous, tinged with pink, and with verdigris-green showing through here and there. The usual warts are polished, but otherwise like the adjacent skin, except for a small dark brown dot in the middle, from which springs a pale ochreous bristle.

Pupa very dark brown, polished, much paler between the segments; wing cases, &c., very distinct; there are two small hair-like projections from the last segment.

The moths began to emerge on May 6th, 1889.

I find that the imago, like its relative, *H. elutata*, will fly on nights when scarcely anything else is on the wing, but it is not, so far as I have seen, an abundant species, and is also local. I only take it here in one place, though there is plenty of sallow in the neighbourhood.

I delayed the publication of the above in order to obtain fuller information on one or two points, and have been unable to secure eggs until the present year.

Monte Video, near Weymouth:
September 13*th*, 1891.

ADDITION TO THE LIST OF BRITISH *HEMIPTERA*.

BY EDWARD SAUNDERS, F.L.S.

HENESTARIS HALOPHILUS, Burm., Hand., II, i, p. 292.
= *geocoriceps*, Antess.

In examining my series of what I believed to be the ordinary *H. laticeps*, Curt., I was surprised to find this very distinct species mixed with it; the few I have were taken near Herne Bay, and I remember noticing at the time their more uniform and darker coloration, but I put them away with *laticeps*, and thought no more about them till I re-examined them the other day. The two species are so distinct, that I feel ashamed of myself for not having noticed the difference before, and what makes the matter worse, I find them similarly mixed in my European Collection; possibly others may find them mixed also. I give below its chief distinctive characters.

Head with the eyes less produced than in *laticeps*, and on wider stalks, which are inclined slightly backwards, but not upwards; the distance between the eye and the pronotum is not nearly as long as the eye itself, and the eyes tend to embrace the anterior margin of the pronotum; the antennæ have their apical joints as long as or longer than the 3rd; pronotum much shorter than in *laticeps*, squarer and less raised posteriorly. In colour the whole insect is generally darker, sometimes nearly black, but I have seen some as pale as *laticeps*, which is also variable in colour.

Hab.: in a saltmarsh at Hampton, near Herne Bay.

Mr. Champion has taken it at Whitstable and Sheppey, and records its capture also from Whitsand Bay, Cornwall, by Mr. J. J. Walker.

St. Ann's, Woking:
October 14*th*, 1891.

AN EARLIER NAME FOR *TINAGMA BETULÆ*.

BY H. T. STAINTON, F.R.S.

In October, 1890, Dr. Wood published in this Magazine, vol. xxvi, p. 261, the life-history of *Tinagma betulæ*, a species then supposed to be new to science. I added a description of the imago in the same number, at p. 264.

In November, 1885, Dr. Sorhagen had proposed for the same insect (then only known to him by the mine of the larva) the name *Heliozela Hammoniella*, in the Entomologische Nachrichten for 1885, pp. 338 and 339. Dr. Sorhagen showed in this great critical acumen; he recognised from the structure of the mine, proceeding from the stem of the twig, up the foot-stalk of the leaf, and thence into the mid-rib, that the insect must belong to the genus *Heliozela*, of Herrich-Schäffer, and as no species of that genus was then known as a birch-feeder (two species feeding on oak, and one on alder), he concluded, without having seen the imago, and possibly without having seen the larva, that the species was new, and proposed the name *Hammoniella*. Dr. Sorhagen, whilst collecting mines of *Phylloporia bistrigella*, in the little birch trees growing on a peat-bog near Hamburg, had been struck by the mines, also in birch-leaves, of this new species, and he represents in a wood-cut, at p. 339, the different mines of the two species.

In a recent number of the Stettin. Entom. Zeitung, 1891, p. 133, Oberlehrer G. Stange has called attention to this early notice of the insect by Dr. Sorhagen, and has realized its identity with the *Tinagma betulæ* of Dr. Wood and myself. Herr Stange has been fortunate in breeding a considerable number of the imago.

Major E. Hering, in his interesting Ergänzungen und Berichtigungen zu F. O. Büttner's Pommerschen Mikrolepidopteren, in the same number of the Stettin. Entom. Zeitung, refers, at p. 198, to this *Hammoniella* of Sorhagen.

Sorhagen, in his Kleinschmetterlinge der Mark Brandenburg, has an appendix, commencing at p. 317, which mentions rather briefly the species known to occur in other parts of North Germany (many of which may eventually be found to occur in the Mark of Brandenburg); in this appendix he naturally includes any of the species he had recently found when exploring the peat-bog near Hamburg, and at p. 337, he introduces *Heliozela Hammoniella*, though rather strangely he fails to give any reference to his earlier publication in the Entomologische Nachrichten, for the unearthing of which we are indebted to Oberlehrer Stange.

Lewisham: *October* 12*th*, 1891.

MICROPTERYX CALEDONIELLA: ANOTHER NEW SPECIES, PROBABLY FROM BIRCH.

BY A. F. GRIFFITH, M.A.

In April, 1885, I took in Sutherland twelve specimens of a *Micropteryx*, which is very distinct from all our other British species. They differ from all except *Sparmannella* in having the fringes uniformly pale golden, the antennæ are short, and the markings on the wings are otherwise very similar to those of *purpurella*, but the fore-wings are brighter and more regularly and completely reticulated with golden, and the golden anal spot is more distinct.

As the species does not seem to have been observed elsewhere, the name *caledoniella* seems appropriate. Two of my specimens are now in Mr. Stainton's collection, and two in that of Mr. Vine, of Brighton.

In June, 1889, I found a *Micropteryx* larva not uncommonly on birch in the same neighbourhood, feeding like *Sparmannella*, but in consequence of an unfortunate accident the whole batch were killed.

The only other *Micropteryx* which I have met with in Sutherlandshire is a single specimen of *Sparmannella*, with the ground a most rich peacock-blue.

M. caledoniella may be thus described:—

Exp. alar., $4\frac{1}{2}'''$—$5'''$. Head grey, antennæ less than half as long as the fore-wings. Fore-wings bright reddish-purple, often shot with peacock-blue, delicately and regularly reticulated with golden. A large distinct anal spot pale golden, not however extending to the middle of the wing; *fringes pale golden.*

Brighton: *October*, 1891.

Notes on Micropteryx Sangii and Kaltenbachii, &c.—My series of *M. Sangii* have been for two years waiting for a name. They have been collected partly at Sandridge (Herts), and partly in several localities in Sussex. Both when bred and when caught they appear to run somewhat smaller than *semipurpurella.*

Three seasons ago I found a *Micropteryx* larva local and scarce on nut and hornbeam at Abbot's Wood, in Sussex, the blotches appeared to be identical on the two food-plants, and I have no doubt but that they were *M. Kaltenbachii.* They occurred singly, and were even more scattered than the larvæ of *Sparmannella.* I failed entirely in rearing the moths.

I have three specimens of a *Micropteryx*, one taken at Highgate, and two at Tilgate, which appear to answer to the description of *salopiella*, the ground-colour being reddish rather than purple, and the large distinct anal spot being rather silvery, but they are as large as the largest *semipurpurella* in my series. Are these true *salopiella?*—Id.: *September*, 1891.

Plusia moneta at Cambridge in 1890.—A fine specimen of this species was taken at rest in August, 1890, by Mr. J. C. Rickard just outside Downing College Grounds. —Id.: *October 12th*, 1891.

NOTES ON *EUPŒCILIA SODALIANA*, HAW. (*AMANDANA*, H.-S.), WITH DESCRIPTION OF THE LARVA.

BY W. G. SHELDON.

This species is not uncommon in a locality a few miles from Croydon, and I have taken it in some numbers for several years.

The imago appears in June and July, the earliest date in my diary is the 15th of June, and the latest the 8th of July, it is usually well out by the 20th of June, and quite *passé* by the end of the month; during the day it is exceedingly sluggish, appearing to hide amongst the thickest growth, and if disturbed dropping like a stone; early in the evening a few specimens may be found sitting upon the leaves of the food-plant, common buckthorn (*Rhamnus catharticus*), or on the grass stems under the bushes.

Flight usually commences about half-past eight, and is over by nine o'clock, during this time a fair series may usually be taken on a warm and still night by standing under a buckthorn bush and netting the specimens as they fly over it, their white colour rendering them easily discernible; after nine o'clock hardly one will be seen.

The ova are deposited on the berries, apparently singly, the larva hatches in about fourteen days, burrows into the berry, and feeds upon the contents; when these are devoured, another berry is selected, and the process goes on until the larva is full-fed, which is usually by the end of August.

The infected berries turn purple much earlier than the sound ones. The larva has a habit of fastening together with silk those berries in its immediate neighbourhood. In confinement it burrows freely into virgin cork, forming therein a tough leathery cocoon, in which it passes the winter, unchanged; probably in nature the bark of its food-plant furnishes it with a hibernaculum.

The following is a description of the full-fed larva, made with the assistance of a glass:—

Length, $\frac{3}{8}$ inch, moderately stout, sluggish, head highly glabrous, amber coloured, mouth darker; on the second segment is a jet-black shining plate, divided in centre; dorsal area purple; between the segments light pea-green; dorsal canal not apparent, except when larva is crawling; anal segment has an indistinct green plate spotted with black; on each segment are several humps, each one of which emits an indistinct hair. Ventral area light pea-green.

15, Alexandra Road, Croydon:
September 14*th*, 1891.

A new work on the Lepidoptera of the British Islands.—I have undertaken a very serious task, and do not in the least under-estimate its difficulties. The amount of knowledge of our British *Lepidoptera*, from the large number of students, is now so enormous, that a work on the subject to be equal to modern requirements must necessarily be a formidable undertaking. This, however, is what I aspire to, and, well knowing that no one man can in a lifetime hope, himself, to work it up, I ask for the help of those who have made a practice of observing insects in their natural conditions. I have been so engaged for forty years, and naturally have personal knowledge of the majority of the native species; and what I now want is information as to the habits (particularly in the perfect state) of the more rare, and especially of the *very local* species, their manner of flight, time of flight, habits of resting, of feeding, of amusing themselves, everything about them in their living state. An enormous mass of information is already in hand, but there must still be a great deal of unpublished knowledge, and for this I ask. The friends to whom I have applied have responded in the warmest and kindest manner, but I cannot write to every one.

The *Rhopalocera* will come first, of course, and I want observations of the living and moving habits of any local butterflies, but particularly of such as I have little or no personal acquaintance with in their native haunts, as *Melitæa Cinxia*, *M. Athalia*, *Erebia Blandina*, *Thecla pruni*, *T. betulæ*, *Hesperia paniscus*, and *H. comma*.

I am extremely anxious to examine one of the British specimens of *Danais Archippus* (*Plexippus*), and if possible, of *Lycæna bœtica*. Probably, it will be necessary to *figure* these species from European or exotic specimens, but it is important to *see* and *compare* the native specimens as far as possible.

One further question. Can any one furnish, *from personal knowledge*, particulars of any capture of the larva of either *Pieris Daplidice*, *Vanessa Antiopa*, or *Argynnis Lathonia* in the United Kingdom?—CHAS. G. BARRETT, 39, Linden Grove, Nunhead, London, S.E.: *October 6th*, 1891.

Coleophora leucanipennella, Hb.: an addition to the British fauna.—An example of a *Coleophora*, which agrees with this species in every respect except that it is smaller than is usual, was taken by the Rev. C. T. Cruttwell in a small wood on the borders of Norfolk, flying with other species of the same genus in one of the open wood-paths in June, 1890. In June last, I went down to Denton, to assist him in searching for more, but no success whatever attended our efforts in that direction, and the single specimen of the previous year remains, as far as is known, unique in this country.

It is somewhat allied to *saturatella*. Its head and palpi are silvery-grey, antennæ also silvery-grey with darker rings. Fore-wings glossy, dark bronzy-grey, shot with reddish; the costa regularly and rather broadly white from the base almost to the apex, where it tapers off into the costal cilia, which are dark grey; remaining cilia dark bronzy-grey. Hind-wings dark grey. Thorax bronzy-brown; abdomen dark brown. A pretty and distinct looking species.

Sorhagen says that its larva lives in a seed capsule of *Silene nutans*, *inflata*, or *Lychnis viscaria*, in June, afterwards cutting off the capsule and using it as a case. —ID.

White form of Diaphora mendica, ♂.—When in the north of Ireland last month, I took the opportunity of examining all the local collections of *Lepidoptera* within reach, and was surprised to find that every male *mendica* taken in the north is of the same pale cream colour as those from the neighbourhood of Cork. I am not sure whether the smoky dark form is known to occur at all in Ireland.—Id.

The larva of Spilosoma sordida, Hüb.—In one of my Swiss tours several years ago (viz., in 1880) I found the eggs of this alpine species laid on a bare rock in a neat and regular circle like a watch spring, between Chamounix and Martigny; they were of a whitish-buff, but darkened the day before they hatched, when the larvæ were of a pale yellowish colour, with a few very short hairs rising from minute black tubercles. They remained similar in hue after the first moult, but had a pale greyish-white central dorsal line, and also a very faint orange spiracular stripe.

The second moult took place in from ten to twelve days' time, when they became lavender-grey, slightly hairy, with a narrow white central dorsal line.

After the third moult the caterpillars were similar in all respects, but were decidedly darker, more hairy, and with all the markings intensified.

Some, after the fourth moult, assumed the adult skin, which was dark greyish-brown, covered with very dark brown (almost black) hairs of moderate length, the central dorsal line white or very pale orange, and continued from the second to the end of the last segment. The spiracular line is orange, composed of spots, one on each segment from 2nd to 13th inclusive, but much more intense at either end than in the centre. Spiracles very pale buff, encircled by a fine black line. Under-surface pale grey, with a slight greenish tinge. Some remain precisely the same as after the third moult, and do not assume the adult skin until the fifth moult has taken place, but whether this is sexual or otherwise I do not know, as I unfortunately did not make a note of this particular at the time.

Length, 35 to 40 mm. Five pairs of claspers.

They spun a cocoon of hair, earth, &c., on the surface towards the end of August, having hatched during the second week in July, the ova being found on June 12th, so that from egg to pupa a period of close on twelve weeks elapsed.

The larvæ are polyphagous; in 1880 I fed them on elm, in 1881 I forced these pupæ and obtained fine series during the latter half of February, from these I secured several batches of eggs, which hatched during Easter week, the larvæ were then fed on *Lamium*, but they took very readily to gooseberry, hawthorn, and nettle, which happened to be in the breeding cage at the same time for other species. The 1881 larvæ spun up during the latter part of June, the time between each moult being from ten to fourteen days. The perfect insects did not appear until the following year, when all the ova proved to be infertile.—G. T. Baker, Clarendon Road, Edgbaston: *October* 1*st*, 1891.

Re-union between the same moths.—Cases of re-union between the same moths, as cited by Mr. Eustace R. Bankes (*ante* p. 274) would, I believe, be by no means uncommon, if opportunities were given for their occurrence. It is only when moths are reared in confinement that we can be sure of all the circumstances agreeing with the case mentioned, and it too frequently happens that a pairing having been once observed, the male is removed out of reach of the female, and all chance of a second pairing thus prevented. It not infrequently happens that when ova are obtained from captive females, a portion of the batch prove infertile, indeed, I have long held an opinion that it is the rule rather than the exception, and have, therefore, generally allowed the male to remain with the female during the time that she was depositing ova, and have, on more than one occasion, observed what I believe to be an act of re-union after a natural separation; but in the following case the details were carefully observed, and entered in my diary at the time. On May 24th, 1889, four males and three females of the Irish form of *Spilosoma mendica* emerged from pupæ, one of each sex was selected and the two put together in a cardboard box covered with leno for a lid, through which their movements could be well observed without interfering with them. At 8 a.m. on the 25th they were *in cop.*; they were left undisturbed during the day, and in the evening they had separated and ova were deposited, and on the morning of the 26th, at the same hour, they were again paired. Thus there were two distinct pairings between the same individuals, and ova were deposited before the second act of copulation took place.—ROBT. ADKIN, Lewisham: *October*, 1891.

Omias mollinus, Boh.—I have taken several specimens of this local insect near the Trent, on the borders of Lincolnshire and Nottinghamshire.—A. THORNLEY, South Leverton Vicarage, Lincoln: *October*, 1891.

[This beetle used to be found by the late Mr. W. Garneys and myself on the banks of the Old Trent at Repton, Burton-on-Trent; it probably occurs throughout the Trent valley.—W. W. F.]

Gnorimus nobilis, L., and Trichius fasciatus, L., in Herefordshire.—Mr. E. W. Bowell has recently sent me a single specimen of *Gnorimus nobilis*, labelled Hereford, July, 1891, and three or four specimens of *Trichius fasciatus*, from the banks of the river Monnow, Herefordshire, concerning which he writes as follows: "These were bred by my friend Dr. Chapman, the food of the larva being the wood of *Alnus glutinosa*. I have seen the insect flying on several occasions;" in that same box was a specimen of *Molorchus minor*, taken at a Roman villa near Woodstock on July 1st.—W. W. FOWLER, Lincoln: *October 10th*, 1891.

Trechus lapidosus, Daws., and other Coleoptera, &c., at Charmouth, Dorset.—While staying at Charmouth in August, I found *Trechus lapidosus* in numbers under shingle at the mouth of the Char; the mouth of the river was entirely silted up, forming a long pond, and on its banks I took fifty or sixty specimens of the beetle in one morning; *Bembidium saxatile* was very abundant, accompanied by the var. *vectensis*, and *Myrmecopora* (*Tachyusa*) *uvida*, and other small *Staphylinidæ*, were to be found, but sparingly; after some heavy rains the Char burst through into the sea, and the *Trechi* seemed to disappear. On the road between Charmouth and Lyme Regis, I beat about a dozen specimens of *Lebia chlorocephala*, var. *chrysocephala*, off broom; they were very scarce, and occurred singly, or in small numbers, on different days; not a single specimen of the type form was seen; *Gonioctena litura* was very abundant on the broom; I did not come across any specimens of the dark variety, but found two or three red or dull scarlet examples; the colour, however, faded after death; I have not seen a record of this variety, which is very distinct in life; beetles, as a rule, appeared to be scarce, and I took very few worth recording. I may, perhaps, mention *Otiorrhynchus raucus, scabrosus,* and *ligneus, Hydrocyphon deflexicollis, Tychius meliloti, Adimonia tanaceti,* and *Anisotoma litura; Anthonomus rubi* was rather plentiful on flea-bane flowers, and I found a few violet-coppery specimens of *Œlemera cærulea,* the only male being of a deep purple colour. *Harpalus rotundicollis* was taken busily engaged at the seed-head of knapweed, or an allied plant; I have found *Harpalus puncticollis* in the same situation at Filey: as far as can be seen they are devouring the seed, and not searching for small insects; in this point certain of the *Ophonus* group appear to be related to *Zabrus.*

Among the *Hemiptera* I swept a single specimen of the apparently very rare *Deræocoris seticornis*; the only other example I ever met with was at Filey. I also took *Rhyparochromus chiragra, Heterocordylus tibialis,* and *Dicyphus annulatus,* the latter in abundance.

One morning I saw a large and beautiful specimen of the straw-coloured variety of *Polyommatus Phlæas,* but failed to secure it. *Vanessa Io* was in abundance in certain spots, but *V. Atalanta* and *V. cardui* were, apparently, entirely wanting. *Gonepteryx rhamni* has been for some years conspicuous by its absence, as far as my observation has gone; has it become more scarce in reality?—Id.

Notes on some Scottish Coleoptera.—The record of *Timarcha tenebricosa,* F., for Scotland was "extremely doubtful," but it is no longer so, as I found seven specimens the other afternoon crawling about on a sunny face of rough waste land. I think, however, it must be very intermittent in its appearance, as I could hardly have overlooked so conspicuous a species during the time I have been collecting; yet it was in this county it had been said to exist, on only very indirect authority. I have lately taken sparingly *Rhynchites cupreus,* L., at the blossom of the rowan tree; it is rare in Scotland. *R. æneovirens,* Marsh., has also turned up on the same trees and oak. While collecting a few days ago with Mr. Lennon near Dumfries, I got one specimen of *Elater nigrinus,* Herbst, which is new to the Solway district; and here I have been getting some examples of *Corymbites holosericeus,* F., these have all been got on Scots fir, which I have not seen named as its habitat. *Subcoccinella* 24-*punctata,* L. (*Lasia globosa,* Schneid.), has turned up here. I have taken several *Gyrophæna minima,* Er., in a fungus; this was hitherto on the Scottish list only on the strength of a single specimen taken many years ago by Dr. Sharp. A solitary ♂ example of *Phyllotreta nodicornis,* Marsh., which I got three or four years ago by the sea here, is, I think, the only Scottish record for this species.—W. D. R. Douglas, Orchardton, Castle Douglas, N.B.: *June* 19*th,* 1891.

Creophilus maxillosus, var. ciliaris, Steph., in Ireland.—At the end of August I took a specimen of *Creophilus maxillosus,* var. *ciliaris,* Steph. (among several of the ordinary type), under a dead dog-fish near Port Balantrae (close to the Giant's Causeway), Co. Antrim, Ireland. I was only in the neighbourhood a very few days or I might have found some more specimens. *Chrysomela Banksi,* F., was apparently not rare at the same locality.—Id.

Homaloplia ruricola: the black variety.—On July 11th last, when collecting on the chalk downs in the neighbourhood of Ashridge, I took a specimen of this rare chafer. At the time I did not recognise the value of my capture, or should have searched in hopes of getting the type form. I am indebted to Mr. C. O. Waterhouse for his kindness in identifying my insect. In the Natural History Museum at South Kensington there are two specimens of this variety, one continental and one British. My capture is a specially large and handsome specimen.—Arthur Cottam, Eldercroft, Watford: *September*, 1891.

Metallites marginatus at Watford.—Canon Fowler, in his new work on the *Coleoptera* of the British Islands, says that this beetle is very local but not uncommon where it occurs, and that it is found on broom and juniper. I have for some years taken it in this neighbourhood, but always on hawthorn. There is very little broom about here, and no juniper within several miles. Last spring the insect was abundant on the hawthorns as soon as the leaves were out. I obtained a good series, and could have taken a very large number had I chosen to do so.—Id.

Coleoptera at Baldock, Herts.—Although I have not had much leisure for active entomology during the season which is now drawing to a close, I have managed to pick up a few things which may be thought worthy of notice. Perhaps the best of these was *Hallomenus humeralis*, of which I took thirty-one examples from a standing dead pine in July; the tree was greatly decayed, so much so, in fact, that an outer layer of wood, about an inch and a half in thickness, came away almost at a touch. Between this and the sounder wood beneath the *Hallomeni* were concealed. They are difficult insects to set, owing to their great fragility, and the antennæ, in particular, will scarcely bear even the most careful manipulation.

Beating hazel bushes into an umbrella early in June produced several *Brachytarsus scabrosus*. I secured eight examples in all, and missed three or four more. They lie motionless for a few minutes in the umbrella, and are very hard to distinguish; when once in motion, however, they are very active, and, in the hot sunshine, take wing almost as readily as blue-bottle flies. A single *Apoderus coryli* turned up with them.

Among a number of *Anaspides* beaten from hawthorn blossom was a specimen which seemed to agree fairly well with two examples of *A. Garneysi*, given to me by the late Dr. Power under the name of *A. variegata*. Not feeling quite satisfied as to the identity of the insect, however, I forwarded it to Canon Fowler, who returns it to me as probably *Garneysi*, the impossibility of examining the male characters preventing him from pronouncing with certainty.

On an old oak fence I found *Ptinus lichenum* in numbers. If it is always as local as in this instance, it must often be overlooked, as it was absolutely confined to about five yards of fencing out of a couple of hundred, and was very hard to see while resting motionless among the lichens.

Single specimens of *Encephalus complicans* and *Phytæcia cylindrica* turned up in the sweep-net. *Poophagus nasturtii* was fairly plentiful upon watercress in a small rivulet, while from the sedge, &c., in the marshy ground which bordered it I got *Baris T-album*, *Donacia affinis*, *Haltica consobrina*, and *Psammœchus bipunctatus*; the last commonly. By beating *Salix* I obtained several *Apion minimum*.

These were taken in September; Canon Fowler, in his "British Coleoptera," gives May and June as the months of appearance. There must, I think, be a second brood; certainly one of my specimens was quite soft, and seemed to have but just left the pupa.

Adimonia capreæ was very common about the second week in September; *A. suturalis* often does duty for this species in collections. The two species are very similar in appearance, but, beyond the structural differences, *A. capreæ* seems always to have two indistinct pale lines running from base almost to apex of each elytron. This character is not noticed in the descriptions which I have seen, but, as far as my own experience goes, is constant. The habitat of the two species, of course, is perfectly distinct.

Sweeping *Lathyrus pratensis* produced a few specimens of *Bruchus loti*, and a curiously coloured example of *B. rufimanus*. *Otiorrhynchus raucus* I met walking along the high road, and *Diphyllus lunatus* had chosen to end its days in my water but. *Bolitochara lucida* was fairly common in toadstools in June. Among the *Hydradephaga* my only capture worthy of note was *Haliplus cinereus*, which I found in some numbers in the more stagnant parts of a slowly-running stream.

Three specimens (♀) of *Metœcus paradoxus* have just reached me from a correspondent at Bury St. Edmunds, who took them from a wasp's nest in the neighbourhood of that town. With them were an example of *Myrmedonia limbata*, which I always thought was exclusively attached to ants, and a number of *Cryptophagi*, which await identification.—Theodore Wood, Baldock, Herts: *Oct. 2nd*, 1891.

Pulvinaria oxyacanthæ, Linn.—In May, 1884, on a hawthorn bush in Beaufort Gardens, Lewisham, I found a mature scale of *Pulvinaria oxyacanthæ* (Ent. Mo. Mag., xxii, p. 158), but neither then nor in subsequent years could I get another, which was curious, considering that all the species of the genus are of gregarious habits. But this year, on June 5th, when casually looking among the trees in Lee's sandpit adjacent, I saw a dozen of the ♀ scales of this species, conspicuous by the white ovisac, on twigs, of last year's growth, of a hawthorn of small size, "cabined, cribbed, confined" under the close shade of a beech tree, so that it could not grow larger; and this situation seemed to suit the *Pulvinaria* exactly. There was no trace of a male scale; it was doubtless too late.

On June 12th I received from Mr. P. B. Mason, Burton-on-Trent, several ♀ scales of a *Pulvinaria* from *Cratægus pyracantha*, growing on the side of a house; these had every resemblance to *P. oxyacanthæ*, and a microscopical examination of the antennæ and legs (kindly made by Mr. R. Newstead) proved that they were really that species. This is interesting, for hitherto the species has been observed only on hawthorn, which, however, is of the same genus.—J. W. Douglas, 153, Lewisham Road, S.E.: *October 6th*, 1891.

Lecanium oleæ, Bernh.—On August 27th last Dr. D. Sharp, Cambridge, sent on a leaf of *Nerium oleander* some scales of *L. oleæ* in all stages of growth. This is the first time, to my knowledge, that this species has been found in England, though it is common on various plants in the south of Europe, and occurs in the United States of America, especially in Florida and California, where it is known as the "Black Scale," and causes great damage to the plants it inhabits, amongst which *oleander* is mentioned (*cf.* Comstock's "Report" for 1880, p. 336). The male is unknown. The simultaneous existence on the same plant of the insects in all gradations of life, shows that the species, like others of the same nature, is pseudagamous, and that there is a continuous production and not distinct broods.

In the Ent. Mo. Mag., xxiv, p. 95, writing of *Lecanium testudo*, Curtis, which I had from Kew on *Brexia madagascariensis* and *Cratæva gynandra*, I said that, except in one small particular, the scales externally were identical with *L. oleæ*; and having subsequently received several exactly similar scales on various plants from Demerara, some of which having been dissected by Mr. R. Newstead, and found to agree as to antennæ and legs with *L. oleæ*, I am now satisfied that *L. testudo* must be referred to that prior species. Signoret, who did not know *L. testudo* except by description (Ess. Cochen., p. 271), surmised that it might be the same as *L. cycadis*, Boisd., but that species is anomalous in having nine joints in the antennæ, and in reality is not known since Signoret's time, so that actual comparison cannot be made and the question decided.—Id.

Bombus soroensis, Fab., at Ilfracombe.—Notwithstanding the rain and wind which have been prevalent lately, I was lucky enough to find a male of the above species on a head of *Senecio* at Ilfracombe. The record of this locality is, I think, worth making, as I do not know of its having occurred so far west before.—Edward Saunders, St. Ann's, Woking: *October 16th*, 1891.

Hemerobius pellucidus, Wlkr., near Exeter.—The Rev. A. E. Eaton has just given me an example of this rare and very local insect taken by him at Exwick, near Exeter, on the 8th July last. This, I think, is a new locality. It had been previously taken in England by Messrs. J. C. and C. W. Dale at Glanvilles Wootton, and by Mr. J. E. Fletcher near Worcester.—R. McLachlan, Lewisham, London: *October 2nd*, 1891.

Concerning the female of Isocelipteron fulvum, Costa.—I am not sure that the female of this insect has been previously noticed. I have before me a ♀ from near Amasia in Asia Minor, lent me by Mr. Albarda of Leeuwarden. It differs from the ♂ in the apex of the abdomen being obtuse and without appendages, and in the *absence* of the blackish scale-like hairs on the inner margin of the wings (especially the posterior) so conspicuous in the ♂. In connection with this my notes on allied species, published in Ent. Mo. Mag., xxii, p. 215, should be compared.—Id.: *October 11th*, 1891.

Drepanopteryx phalænoides, Linn., in Scotland.—On the 5th instant I had a few hours' collecting at Cleghorn, and a single specimen of this interesting insect, beaten from hazel, gave some value to my otherwise not very rich booty. So late in the season it was hardly looked for, and its appearance is the more noteworthy seeing it has been an absentee for five or six years, although repeatedly sought after. This makes the fourth specimen from Cleghorn, probably the greatest number yet taken in Britain in one locality. The insect proves to have a wider range in the Glen than was thought probable, as the present specimen was taken at some distance from the place were those previously recorded (Ent. Mo. Mag., xxii, p. 139) were found.—Kenneth J. Morton, Glenview, Carluke, N.B.: *October 8th*, 1891.

Societies.

Birmingham Entomological Society: *Sept.* 21*st*, 1891.—Mr. R. C. Bradley in the Chair.

Mr. P. W. Abbott showed *Tæniocampa opima* and *gracilis* and *Nyssia zonaria* from Wallasey; also *Argynnis Paphia*, var. *Valezina*, from New Forest. Mr. G. W. Wynn showed *Sesia culiciformis* from Wyre Forest. Mr. W. Harrison showed a bred series of *Selidosema ericetaria* from the New Forest. Mr. R. C. Bradley showed four specimens of *Pteropœcila Lamed* from Sutton; he said Mr. G. H. Verrall had confirmed the species. Mr. Wainwright showed *Plusia orichalcea* and *Arctophila mussitans* from North Cornwall. Mr. W. Harrison showed a box of beautifully preserved larvæ; he managed to retain the green colour in *Saturnia carpini* and others by inflating them and allowing them to dry naturally, without the application of heat: this took about twenty minutes.

October 5*th*, 1891.—Mr. W. G. Blatch, President, in the Chair.

Mr. R. C. Bradley showed a long series of *Spilographa Zoe* from Moseley; this species is not usually found in more than odd specimens, but Mr. Bradley succeeded in taking it freely from the under-sides of leaves at Moseley. Mr. G. W. Wynn showed a boxfull of large American *Bombyces*; also *Xylophasia hepatica*, which he had bred from pupæ found underneath the bark of poplars at Cleeve Prior; they were in cocoons and situations which exactly resembled those of *Acronycta megacephala*. Mr. W. Harrison showed *Papilio Machaon* from Wicken. Mr. W. G. Blatch showed the following beetles: *Ilybius ænescens* from Tysoe, Warwickshire; *Homalota crassicornis* from Bewdley; *Oxytelus fulvipes*, *Henoticus serratus* (a series), *Micropeplus tesserula* (a series), and *Lampronia luzella*, all from Knowle.—Colbran J. Wainwright, *Hon. Sec.*

Lancashire and Cheshire Entomological Society: *October* 12*th*, 1891.—The Vice-President, The Rev. H. H. Higgins, in the Chair.

Mr. C. E. Stott read a paper, entitled, "Notes on *Celæna Haworthii*," in which he described the haunts of this species with its earlier stages, and concluded by describing the different local varieties. Mr. J. Collings read "A few remarks on *Aplecta nebulosa*," stating he had bred five melanic forms from Delamere, for which he proposed the varietal name of *Robsoni*, in honour of the well known entomologist, Mr. J. E. Robson, of Hartlepool. The Secretary read a communication from Mr. J. W. Tutt, who wrote, that the specimens of *Tortrix Donelana* exhibited at the last Meeting had, at the South London Entomological Society, been stated to be *T. Steineriana*, var. *Dohrniana*, and that the name of *Donelana* would, therefore, fall to the ground. But it was pointed out that *Donelana* had already been referred to *Steineriana*, but incorrectly. Mr. Townsing showed a remarkable gynandromorphous specimen of *Orgyia antiqua*, the head of which possessed the male structure, while the body was that of the female. Mr. Harker, a variety of *Vanessa Io*, the ground colour of which was fulvous-brown. Mr. Gregson, a very variable series of *Dianthœcia conspersa*, including the melanic form. Messrs. Townsing and Prince, dark forms of *Abraxas grossulariata*. Mr. Pierce (the Secretary), *Retinia resinana*, and their resinous nodules from the fir trees.—F. N. Pierce, *Hon. Sec.*, 143, Smithdown Lane, Liverpool.

The South London Entomological and Natural History Society: *August 27th*, 1891.—W. H. Tugwell, Esq., President, in the Chair.

Mr. Tugwell exhibited a series of *Bryophila perla*, Fb., from Kent, showing great variation. Mr. Tugwell also exhibited, on behalf of Mr. J. E. Robson, of Hartlepool, *Lycæna Astrarche*, Bgstr., collected at Durham, and showing the species in all its forms, vars. *Salmacis*, St., and *Artaxerxes*, Fab., with intermediate forms. Mr. S. Edwards, the genus *Charaxes*, and read notes on the distribution of the species. Mr. Carpenter, varieties of under-sides of *Thecla rubi*, L.; *Eugonia quercinaria*, Hufn., bred from ova, and unusually dark. Mr. Frohawk, *Pieris napi*, L., from different localities, and three females showing graduation of an additional spot between the third and fourth nervules, one male entirely white; pale and dusky forms of the female; and a banded form of *Pararge Megæra*, L., taken at Chattenden, 1861. Mr. Mera, living larvæ of *Acronycta tridens*, Schiff. Mr. West (Streatham), the Lewes form of *Gnophos obscuraria*, Hb. Mr. Turner, bred series of *Pelurgia comitata*, L., and of *Hypsipetes sordidata*, Fb.; also a living larva of *Stauropus fagi*, L. Mr. C. Fenn, *Odontia dentalis*, Schiff., bred from *Echium*, *Hyria muricata*, Hufn., *Anerastia lotella*, Hb., *Crambus uliginosellus*, Zell., *C. contaminellus*, Hb., and *Sericoris conchana*, Hb., from Deal and neighbourhood. Mr. H. A. Sauzé, a case of *Coleoptera*, containing twenty-six species. Mr. West (Streatham), an example of *Nænia typica*, with two tibiæ and tarsi on left front femur. Mr. Billups, British *Diptera*, including *Nemoræa strenua*, Meig., from Oxshott; *Eristalis sepulchralis*, L., a male taken at Plumstead; also a female of the rare *Hypoderma bovis*, Deg.; *Phytomyza aquilegiæ*, Hardy, reared with its parasite, *Rhizarcha areolaris*, Nees, from leaves of the columbine growing in his garden at Peckham. Mr. Billups also exhibited *Polysphincta varipes*, Gr., and a cocoon of *Attacus Cecropia* from New York State, received from Mr. Turner, and from which he had bred forty-eight specimens of a species of *Cryptus*, closely allied to the British *Cryptus digitatus*.

September 10th, 1891.—The President in the Chair.

Mr. W. F. Robinson, of Notting Hill, was elected a Member.

Mr. S. G. C. Russell exhibited a large number of *Argynnis Selene*, Schiff., from North Hants localities. Mr. Carpenter, a fine series of *Pericallia syringaria*, L., bred from ova received from Essex, and of *Dianthœcia albimacula*, Bork., bred, from Kent. Mr. Frohawk, a series of *Polyommatus Phlæas*, L., and pointed out the advantage of rearing this species from ova, as those bred were much larger than captured specimens. Mr. Joy, a melanic specimen of *Boarmia repandata*, L., taken near Grange. Mr. R. Adkin showed a series of *Psodos coracina*, Esp., bred this spring, from Rannoch. Mr. C. Fenn, about fifty caught specimens of *Agrotis corticea*, Hb., showing the variation of the species at Deal. Mr. Barker exhibited a dark variety of *Arctia Caia*, L., and Mr. Weir remarked that he had once seen a series arranged according to whether the antennæ were white or black. Mr. Short exhibited varieties of *Arctia Caia*, L., in one example the whole markings of half of the superior wings were absent. Mr. Tugwell showed examples of *Melitæa Aurinia*, Rott., from English, Irish, and Scotch localities, and made some observations on the local variation of this species, and a discussion ensued.—H. W. Barker, *Hon. Sec.*

Entomological Society of London: *October 7th*, 1891.—Dr. David Sharp, F.R.S., Vice-President, in the Chair.

The Chairman referred to the death, on the 14th September last, of Mr. E. W. Janson, who had been a Member of the Society since 1843, and who had formerly filled the offices of Secretary and Librarian respectively.

The Rev. Dr. Walker exhibited a long series of several species of *Erebia*, and of *Argynnis Pales*, which he had recently captured near Roldal, in Norway.

Mr. W. L. Distant exhibited specimens of *Danais Chrysippus*, with its two varietal forms, *Alcippus*, Cram., and *Dorippus*, Klug, all which he found together in the Pretoria district of the Transvaal. Mr. Jenner Weir, Colonel Swinhoe, and Mr. Distant took part in the discussion which ensued as to these forms and their distribution.

The Rev. W. F. Johnson sent for exhibition specimens of *Velia currens* from stagnant water near Armagh; also a specimen of *Nabis limbatus*, killed whilst holding on to its prey, a very hard species of Ichneumon. Mr. Saunders thought that, from the nature of the Ichneumon, the only chance the *Nabis* had of reaching its internal juices would be through the anal opening, as recorded by Mr. E. A. Butler in a similar case, in the Ent. Mo. Mag., October, 1891.

Mr. F. P. Pascoe exhibited two British species of *Diptera*, unnamed. He said they had been submitted to Mr. R. H. Meade, but were unknown to him, and are probably new to the British list.

Mr. R. Adkin exhibited two specimens of a supposed new species of Tortrix (*Tortrix Donelana*, Carpenter), bred from larvæ found on pine trees at Tuam. Mr. C. G. Barrett said he examined the specimens with great care, but he did not consider that they belonged to a new species. He was unable to distinguish them from *Tortrix viburnana.*

Mons. A. Wailly exhibited preserved larvæ, in various stages, of *Citheronia regalis*, which he had bred from ova received from Iowa, United States. He said that the inhabitants called this larva the Hickory Horned Devil, and that the specimens exhibited were the first that had been bred in this country. Mons. Wailly further exhibited three female specimens of *Antheræa yama-mai* bred from cocoons received from Japan; also a nest of cocoons of *Bombyx Radama*, received from the west coast of Madagascar. Prof. J. B. Smith, of the United States, and Col. Swinhoe took part in a discussion on the habits of the larvæ of *Citheronia regalis*, and as to the period at which they dropped their spines prior to pupating.

Dr. Sharp exhibited several specimens of a weevil, *Ectopsis ferrugalis*, the ends of the elytra of which bore a close resemblance to the section of a twig cut with a sharp knife. He said he had received the specimens from Mr. G. V. Hudson, of Wellington, New Zealand, who stated that they were found resting in large numbers on dead trunks and branches of *Panax arborea* in the forests.

Mr. G. C. Champion stated that the species of *Forficulidæ*, captured by Mr. J. J. Walker, R.N., in Tasmania, and exhibited by himself at the meeting of the Society in April last, was, he believed, referable to *Anisolabis tasmanica*, Bormans, described in the "Comptes Rendus" of the Ent. Soc. Belgique, 1880, p. lxviii.

The Rev. A. E. Eaton made some remarks on the synonymy of the *Psychodidæ*, and stated that since August, 1890, he had identified all of the British species in Mr. Verrall's list, except *Sycorax silacea*.

Mr. Gervase F. Mathew, R.N., communicated a paper, entitled, "The effect of change of climate upon the emergence of certain species of *Lepidoptera*." A discussion followed, in which Mr. Stainton, Mr. Barrett, Dr. Sharp, and Mr. McLachlan took part.—H. Goss, *Hon. Secretary.*

SOME NEW, &c., *LEPIDOPTERA* FROM CHILI.

BY WM. BARTLETT-CALVERT, F.E.S.

On looking over my collection the other day, I noticed that I had put aside in one of my boxes several moths which had caught my attention when collecting in the Indian territory of Araucania some eighteen months ago, and on comparing them with Butler's, Felder's, and others' descriptions, found that they were either examples of lost types or new species, so I now give a list of both the lost (?) and describe the new species ; and I think I might say that when I am able to compare my collection with that of the British Museum, I shall still be able to present some five or six new species of Geometers, and, perhaps, a few Micros, and a species of *Hepialidæ* with pectinated antennæ from Alfalfar, Cordillera of Santiago.

Iochroa chlorogastra, Feld. u. Rogenh., Reise der Fregata Novara um der Erde, Lep. iii, plate 99, fig. 17, 1875 ; Araucania, in June. One specimen only, now in Dr. Izquierdo's collection.

Mallocephala rubripes, Blanchard, Gay's Hist. Fisica i Politica de Chile, page 68, atlas ii, plate 4, fig. 7 ; Araucania, in February. Of a smoky-black colour, wings semi-transparent ; thorax black ; sides of thorax slaty, with an orange-yellow band above and at bottom, near base of wing ; abdomen a vermilion-red. This species I always found by day on the walls of the house beneath the corridor ; I only got males, so I expect that the ♀ will either be apterous, or have aborted wings.

Rhinodia bi-ocellata, Feld. u. Rogenh., *l. c.*, plate 129, fig. 14 ; Araucania. One specimen, caught flying by day in the woods.

Phasiane catillata, Feld. u. Rogenh., *l. c.*, plate 129, fig. 3 ; Araucania ; in the lamp at night.

Cœnurgia runica (*Euclidia*), Feld. u. Rogenh., *l. c.*, plate 117, fig. 11 ; Araucania ; caught flying by day amongst grass, and taken by night in the lamp, both ♂ and ♀. The male has pectinated antennæ, and is of a dull leaden hue, whereas the female is brighter coloured, and has not pectinated antennæ, but very finely serrated ones.

Bacillogaster hypparia, Feld. u. Rogenh., *l. c.*, plate 132, fig. 35 ; Alfalfar. One specimen ; lamp at night.

TETRACIS IANTHINUS, *sp. nov.*

♂ ♀. *Alis anticis supra violaceis nigro-punctatis ; margine fulvis, lineis transversalibus, macula discoidali spadiceis ; posticis supra violaceis nigro-*

punctatis, lineis transversalibus spadiceis; subtus, anticis violaceis silaceis; posticis violaceis pallidioribus; macula discoidali nigra.

Exp. alar., ♂, 41 *mm.*; ♀, 44 *mm.*

Hab.: Pemehue, in Araucania; mensis Februarius.

♂ ♀. Wings on the upper-side of a beautiful light violet colour, with the outer half of wings profusely black speckled; fore-wings with a chestnut-coloured dot at end of cell, and a wide stripe of same rich colour from the outer third of inner border to near apex; hind wings with a less pronounced stripe from centre of abdominal border, and fading into the ground colour before reaching the upper border of the wing; fringe on all the wings of the same rich chestnut colour; upper half of abdominal border fringe white; under-side of wings of a lighter hue than above, the fore-wings clouded with ochre, the stripe on the upper-side faintly showing; hind-wings with a black spot at outer end of cell; thorax violaceous, body whitish, under-side dirty white; legs ochraceous; femur violaceous. The ♂ is rather lighter in colour than the ♀.

SIONA TRIANGULARIA, *sp. nov.*

Alis supra omnibus fumosis, argenteo-splendentibus; subtus, anticis fuscis, lineaque apicali lactea; posticis fuscis, lineaque in similitudinem trianguli albida lactea. *Exp. alar.*, 39 *mm.*

Hab.: Punta Arenas, in Freto Magellanico; mensis Junius.

Wings on the upper-side of a shining smoky-silvery hue, with the markings of under-side showing through; under-side, fore-wings of a darker colour than above; costal border and apex ferruginous, with a short milky-white dash at apex; hind-wings of a beautiful chocolate-colour, crossed by two diverging milky-white stripes, running from the base of wing to outer border, the one running parallel to the abdominal border, the other (which is slightly arched) on the upper third of wing; from the abdominal border just above the inner angle of wing another stripe runs towards the outer angle of wing, crossing the abdominal stripe, and on reaching the upper curved one, turns off abruptly at an obtuse angle and terminates at the outer third on the upper border of the wing, so that these stripes form a large triangle with prolonged sides; on the outer border of the wing and midway between these prolongations is a white dash, this dash and the upper edge of curved stripe are black bordered; on either side of curved stripe above the cell are two little dashes; thorax colour of upper-side; abdomen smoky-brown.

This species is easy of recognition; a large milky-white triangle on a chocolate-coloured ground.

This species differs from Butler's *S. columba*, Trans. Ent. Soc, page 422, 1882, in its having the abdominal stripe from base to margin in lieu of the two oblique dashes, and the marginal line instead of the spot on the second median interspace, as also in its larger size.

OPORABIA? ARENOSA, *sp. nov.*

♂. *Alis anticis supra cineraceis; lineis transversalibus denticulatis numerosis fuscis; posticis supra omnino cineraceis; subtus omnino cineraceis.*

♀. *Alis supra albidis; lineis transversalibus denticulatis numerosis fuscis; subtus subalbidis.* *Exp. alar.*, ♂ ♀, 34 *mm.*

Hab.: Coquimbo; mensis November ad Februarium.

♂. Fore-wings of an ashy colour, with a wide irregular shaped sepia-coloured band across the centre of the wing, and wider on the costal border; this band is again crossed from costa to inner margin by numerous lunulated lines of a darker hue, and bounded on their outer edge by whitish stripes of irregular shape; on the outer side is an irregular zig-zag line of a dark brown, between this line and the outer border a white zig-zag line runs from the angle to the costal border very near apex, between these two lines on the second and third interspaces are two short black dashes; basal fourth of wing same colour as band; hind-wings of a dirty white or ash colour without markings; under-side of all the wings of a smoky colour, with the broad band of fore-wings showing through; fore-legs smoky, banded with white; fringe smoky.

♀. Of a snow-white colour on all the wings; pattern of male, but the band on fore-wings of almost the ground colour; a few curved lines on the outer border of hind-wings from outer to anal angle; under-side of all the wings whitish; fringe whitish, separated from the wing proper by a fine brown undulated line.

DIGONIS PHILIPPII, *sp. nov.*

♂ ♀. *Alis utrinque sulphureis; lineis transversalibus flexuosis fumosis; macula discoidali nigra fumosa.* *Exp. alar.*, ♂, 29 *mm.*; ♀, 36 *mm.*

Hab: Araucania; mensis Februarius.

♂ ♀. Wings on both sides of a sulphur-yellow; fore-wings, above, costa mottled and striated with brown; two sinuous and dusky lines across the centre of the wing, one at the basal and the other at the outer third of wing; the inner one forming an open ≷ shape; these two lines are wider apart on the costal than at the inner border of wing; at the upper or apical end of cell (between these two lines) is a well-defined black Z-shaped marking; hind-wings with two ill-defined lines across the wing; a black discal spot; outer borders of all the wings chocolate-coloured; under-side of wings as above, the Z-shaped discal spot of upper-side forming only a small dash; thorax and abdomen pale yellow.

I have named this species in honour of Dr. Philippi, who has been kind enough to help me on several occasions with regard to our Chilian *Lepidoptera.*

EPIMECIS? MEDINÆ, *sp. nov.*

♂ ♀. *Alis anticis supra fumosis, lineis duabus nigris cum angulo acuto transverso centrali, inter lineam et apicem fuscis; linea curva albida subapicali; infra nigra, in tertio basali maculaque transversa oblonga luteis; linea curva subapicali albida; posticis, supra duabus partibus basalibus rutilis; linea nigra ad marginem abdominalem; tertio externo nigris; infra, duabus partibus basalibus flavis; tertia externa nigra, medio fascia dentata flavida arcuata divisa; thorax et abdomen fumosa; corpus infra ravus; femina maris pallidior.* *Exp. alar.*, ♂, 56 *ad* 60 *mm.*; ♀, 68 *mm.*

Hab.: Valdivia. In coll. Medinæ.

♂ ♀. Fore-wings on the upper-side of a smoky colour, thickly marked with fine black dashes; two black and very acute angled lines across the centre of the wing, and which enclose a dark brown band, apical part of wing same colour; near the apex is a lunulated white dash running from the costal border inwards about 4 mm., and from the lower extremity of this dash to the outer angle the wing is clouded with blackish patches, and also on inner border, between the base and inner angulated line; under-side black, with the inner border smoky-piceous; basal third of wing, and a large oblong patch on outer third yellowish, inclining to red; white apical lunulated dash of upper surface; hind-wings, on the upper-side, the basal two-thirds of a fiery-red colour, with a curved black stripe running from the abdominal border (just above anal angle) to near the centre of wing, and a black ⅂-shaped marking on the centre of upper border, outer third of wing black, wider on the upper than on the abdominal border; the under-side is of the same pattern as above, but the colouring is brighter, and at the base inclines more to yellow; the black outer border is bisected by a curved dentate yellowish band from upper to abdominal border; thorax and abdomen smoky, with a few white hairs on thorax; body below drab coloured. The female is paler and duller in colour than the male, and the abdominal border of hind-wings smoky on both sides.

This fine insect is in the collection of Don José Toribio Medina, who obtained it in Valdivia, Southern Chili.

At first sight it looks very much like *Catocala electa*, of Europe.

SCOTOPTERYX? GRAPHICA, *sp. nov.*

Alis supra cervinis; anticis cum linea tortuosa in tertio basilari, e alia in tertio externo nigris; venæ albidæ, margine anteriore venisque sub-viridi et nigro maculosis; maculaque basilari et macula discoidali nigris; posticis supra, cum linea tortuosa in tertio externo nigra; venæ albidæ, margine abdominali viridi maculoso; infra, alæ fumosæ; posticæ in dimidio abdominali subalbida, lineaque anguloso in tertio externo et macula discoidali nigris; caput viride; thorax niveus, cum maculaque nigra in prothorace et metathorace; abdomen fumosum. *Exp. alar.*, 61 *mm.*

Hab.: Candelaria, in prov. Curicó. In coll. Medinæ.

Wings above of a fawn or stag colour, fore-wings with two black sinuous lines, one across the basal and the other at the outer third, from costal to inner border; a black discal oblongish spot; veins white; on basal third is a large clouded patch composed of black and brown atoms, a brown stripe across the centre of wing just inside outer sinuous black line; at outer angle a large snow-white patch, from whose upper border a lunulated white line runs midway (to costal border) between black sinuous line and outer border of wing; all the wing, especially base and costa, studded with sap-green atoms and thickly speckled with black dots, more conspicuous on central third of wing, which is of a lighter colour than the rest; there are also (irregularly placed) a few clouded white patches; hind-wings with a black sinuous line from abdominal to upper border, and meeting outer line of fore-wings, as also the brown stripe, but this is not so pronounced as in fore-wings, a large black and white patch at anal angle; veins white; wing studded with green and black spots, being most conspicuous on abdominal border; wings below smoky; fore-wings with pinky reflections; abdominal half of hind-wings creamy-white; an angulated black line from abdominal to upper border; a dark discal spot, and all the wing dark speckled; fore-wings, costa creamy, black speckled, a faint indication of an angulated line, corresponding to that of outer third on upper-side; head green; thorax snow-white on sides, fawn above, intermixed with a few green scales; a dark brown or blackish stripe across pro- and metathorax; abdomen smoky, inclining to fawn, speckled with darker scales; and on the first three segments of abdomen are a bunch of raised green tufts; body and abdomen below dirty brown or drab; legs cream-coloured, black speckled.

I have placed this in *Scotopteryx*, but really I am not sure whether it will remain there.

HYPONOMEUTA RUTILA, *sp. nov.*

Alis anticis supra rutilis; posticis albido-splendentibus; infra, anticis roseo-luteis; posticis albidis. *Exp. alar.*, 15 *mm.*

Hab.: Araucania; mensis Januarius.

Fore-wings on the upper-side of a fiery-red; from the base to near outer angle a darkish stripe runs parallel to inner border; under-side of a rosy-yellow, without markings; hind-wings, above, shining white; below, white; thorax red; abdomen dark brown.

ANTITHESIA MONTANA, *sp. nov.*

Alis anticis in dimidio basali luteis, in postico fuscis, macula orbiculari lutea versus angulum notata; posticis nigris fumosis; subtus fumosa. *Exp. alar.*, 15 *mm.*

Hab.: Lolco, in Araucania; mensis Februarius.

Fore-wings above with a large yellow patch occupying the basal half of wing; outer half of wing and a part of base of a very dark red (in some lights), but generally blackish; in centre of outer half is a large round yellow dot, enclosed in a black ring; hind-wings of a shining smoky-black; under-side of all the wings smoky, inclining to black; head yellow; thorax and abdomen colour of hind-wings; fringe on fore-wings blackish; of hind-wings piceous.

AGRIOCOMA MIMULINA, Butler.

var. araucana.

Alis anticis supra sulphureis; macula fumosa magna; posticis albido-splendentibus; subtus, anticis albido-sulphureis, macula eadem ut supra conspicua; posticis albidis, macula discoidali nigra. *Exp. alar.*, 19 *mm.*

Hab.: Araucania; mensis Februarius.

Of this species, Butler's description of *mimulina* comes pretty near, excepting that the patch is smoky-coloured, instead of reddish, also he does not mention the black discal spot and a series of black dashes on outer border of hind-wings on the under-side; so that should var. *araucana* be elevated to the rank of a new species instead of a variety, as I now place it, it will be distinguishable from *mimulina* by the following:—Triangular patch on upper-side of fore-wings *smoky* instead of *reddish*, and enclosing on its lower edge a bright *silvered dot* in place of *white one* of *mimulina*; under-side of fore-wings *sulphury-white* instead of *snow-white*; under-side of hind-wings with a *black discal spot*, and a series of *black dashes* between the nervules on the outer border at base of fringe; the rest as in *mimulina*.

Santiago, Chili: 1890.

LIFE-HISTORY OF *PLUTELLA ANNULATELLA*, CURT.

BY NELSON M. RICHARDSON, B.A., F.E.S.

Since I have collected at Portland, I have been more or less on the look-out for the larva of *P. annulatella*, but have never come across it until this year, though I have before seen traces of its presence.

I first made acquaintance with this species by shaking an imago out of an overhanging tuft of grass on September 27th, 1887, and this is the only clue that I have to its mode of hibernating, as my other captures have all been made in June and July, in which months I have taken a few each year, but not more than about 20 altogether.

The plant on which it feeds (*Cochlearia officinalis*) is common in many parts of Portland, but the larva seems to be rather local, as in some places it did not appear to be present, though there was plenty of the food-plant; where it occurred at all, it was not uncommon, though until one knew something of its habits, one might easily pass it by unnoticed.

The egg is apparently laid in the flower-bud, as the young larva, which could not in some cases have been hatched more than a day or two before I found it, draws together the petals slightly with silk, and lives inside them, ejecting its frass through the small gaps in its habitation between the petals. It was in this state when I first discovered it in the middle of May, all the larvæ at that time being rather small. As the larva grows, it gets too big for its first little house, not to mention the fact that it has eaten its contents, and for the rest of its larval life it spins a few threads of silk amongst the bunch of flowers and seed pods in a flower-head, and eats flowers, seeds, pods, leaves, and stalks, preferring them in the order in which I have named them. The extent to which a large larva can conceal itself in a flower-head, which seems quite open to observation throughout, is most extraordinary. I have sometimes thought that one might be present from seeing a little eating or a thread or two of silk but could not see the larva itself until I pinched the seed-head, when it immediately rushed out. The larva does not usually leave its dwelling without a little pressure, though sometimes it seems to be off as soon as one looks at it; it hangs by a thread, but as soon as it reaches the ground it generally wriggles and dances in a way that would put even a Tortrix to shame. At the same time, it sometimes appreciates the advantages of lying still, when it curls itself up, so as to bring its head and tail together, and then strongly resembles a small leaf of *Cochlearia* broken off.

A curious habit of the larva is, that when about to eject a grain of frass, it gives its tail a succession of violent jerks, by the last of which the grain is thrown to a distance of several inches. Mr. Hodgkinson suggests (Entom., 1878, p. 11) that the full-fed larvæ get right into the seed-pods; this is quite contrary to my experience at Portland, as, though I looked carefully with this object in view, I never found one in a seed-pod. It is, however, possible that on plants with very large seed-pods they are compelled to get completely inside, in order to get at the contents; at Portland, the larger pods would easily contain a larva, but the seeds could all be eaten by the introduction into the pod of merely its first few segments. As a rule, there was but one larva in a flower-head; a second one would probably sooner or later have come into contact with the first, and caused both to depart suddenly.

In the case of other solitary larvæ, *e. g.*, *C. absynthii*, of which one rarely, if ever, finds two large ones on the same flower-spike of wormwood, my impression is that a deadly conflict takes place, and that the survivor eats its weaker or less active brethren; in the present case, however, it is the most sluggish which is most likely to retain its position.

The young larva is very like the older ones, but, perhaps, a little more brownish in colour, and more transparent. When nearly full-fed, it is about 6‴ or 7‴ in length, and tapers towards the extremities, when it is rather less than half the breadth of the 8th and 9th segments, which are the largest in the body.

The head is green, with a very slight shade of brown, and is much covered with small blackish marks of irregular shape, which are placed in four more or less distinct lines on each side of the middle, in addition to the usual spots, which are intense black. The 2nd segment has also numerous small blackish markings, not so large as those on the head. The body is entirely green, with the exception of the usual warts and bristles, which are jet-black and very conspicuous, so that the larva presents a striking and somewhat formidable appearance under the microscope, particularly about the head and 2nd segment. When full-fed the larva becomes rather more opaque in appearance, and spins a cocoon of very fine network, composed of whitish silk, of the shape of the cocoon of *Z. filipendulæ*, either on the muslin covering or the side of the pot, or occasionally on the surface of the earth or on some part of the plant. It always seems to leave its habitation for a convenient spot. The pupa, to which it turns in a few days, is distinctly visible through the cocoon. It is about 3½‴ in length, greenish-yellow in colour, with a dark brown subdorsal spot on each segment, and with more or less trace of a corresponding double marking underneath. The tip of the abdomen approaches to brown, and the wing, leg, and antennæ cases are brown, the eye-cases black. These markings are sometimes obsolete, though generally distinct. The pupa appears to the naked eye to be smooth, but with a microscope can be seen small blackish bristles, corresponding to those on the larva, and a few very fine long hooks at the tail. The divisions between the segments are not furnished with spines or hooks. Each of these caudal hooks is like a straight piece of wire sharpened at the end, the extreme tip being bent over to form the hook.

The first larva spun its cocoon at the beginning of June, and the first imago emerged on the 27th of that month, so that the pupa state lasts about three weeks. I have found this moth very retiring in its habits, and after a few weeks, during which it flies but little, and that only at night, when it occasionally visits flowers, it appears to settle down in its hibernating quarters until the spring. Before 1887, I believe that not more than half a dozen specimens had been taken at Portland, and none for many years, though the species is not really a rarity there, but is hard to get in the imago state.

The Portland form of this moth is very handsome: the inner margin being white, or nearly so, and sharply contrasted with the rest of the wing. It varies very little in this locality.

From the above description it will be seen that this larva has many points in common with that of *Plutella cruciferarum*, the notorious "Diamond-back moth," which at present shares the honours of the Colorado beetle and the Hessian fly.

Montevideo, near Weymouth:
November, 1891.

A NEW GENUS OF *HISTERIDÆ*.

BY GEORGE LEWIS, F.L.S.

EPIECHINUS, *n. g.*

This genus has many characteristics similar to *Onthophilus*, and its species have hitherto been included in it. The characters which separate it are, however, very important, and such as cannot be overlooked in the Family. They are as follows:—

The antennal fossa is an excavation in the anterior angle of the thorax. The prosternum has a keel bordered on each side with a carina, the carinæ in some species, *e. g.*, *O. costipennis*, Fåhr., meet anteriorly, and enclose an elongate triangular space, in others the carinæ are more parallel to each other, and do not unite anteriorly as in *O. bipartitus*, Lew.

The meso- and metasterna are deeply foveolate, the foveæ varying much in shape, and forming characteristic specific differences, and there is also sometimes in the metasternum a median sulcus.

The upper surface of the species is more or less setose, the setæ being most conspicuous on the costæ, and in the thoracic punctures.

The femora and tibiæ are relatively short, and the tarsi and the antennæ have joints more equal in length and less lax than in *Onthophilus*.

I give a list of the species in both genera, arranged systematically :—

ONTHOPHILUS. Type, *striatus*, F.

Ostreatus, Lew., *sulcatus*, F., *caucasicus*, Reit., *foveipennis*, Lew., *ordinarius*, Lew., *exaratus*, Ill., *cicatricosus*, Reit., *striatus*, F., *flavicornis*, Lew., *affinis*, Redt., *alternatus*, Say, *silvæ*, Lew., *Flohri*, Lew., *Lecontei*, Horn.

EPIECHINUS. Type, *costipennis*, Fåhr.

Novemcostatus, Mars., *costipennis*, Fåhr., *punctisternum*, Lew., *bipartitus*, Lew., *tuberculisternum*, Lew., *hispidus*, Payk., *arboreus*, Lew., *hova*, Lew.

Folkestone: *November*, 1891.

AN ASIATIC *PSYCHOPSIS* (*PS. BIRMANA*, *n. sp.*).

BY ROBERT McLACHLAN, F.R.S., &c.

The singular and beautiful Neuropterous genus *Psychopsis*, Newm., was long considered peculiarly Australian. Recently, however, Prof. Brauer described a species from Kilimanjaro, East Africa, under the name *Ps. zebra* (Ann. k. k. Naturhistor. Hofmuseums, iv, p. 102, 1889). I possess a species from Birmah, which is described below.

PSYCHOPSIS BIRMANA, *n. sp.*

Body for the most part greyish-fuscous, with grey hairs; antennæ (broken) yellowish-grey in the basal portion. Head above blackish, with two large rounded yellowish discal tubercles, and a similar small oval tubercle behind each eye, antennal sockets yellowish; eyes pale leaden-grey; face and palpi pale yellowish. Pronotum much narrowed in front. Legs pale yellowish; femora clothed with long concolorous hairs; spurs of tibiæ very short, testaceous; claws short, testaceous, much curved. Abdomen pale ochreous beneath, with dense whitish silky hairs; at the apex above are two large subquadrate plates, separated at the end by a somewhat triangular excision; beneath are two broadly triangular lateral plates (lying against the dorsal plates), separated and open in front (viewed ventrally), the space between them filled in with dense yellowish hairs; in the middle of the posterior margin of the penultimate ventral segment is a broad triangular excision, in which is a deep blackish fovea.

Wings very pale greyish, subhyaline, with faint darker greyish tessellation, and vague indications of two or three faint transverse fasciæ; some slightly darker spots in the space between the subcosta and sector, which space is slightly dilated towards the end, and four or five more conspicuous darker spots along the cubital region towards the inner margin; fringes and pubescence whitish; costal area very abruptly dilated at the base, the nervules furcate or bifurcate towards the costa (occasionally simple), *not connected by a line of oblique nervules; only two series of gradate nervules,* one between the end of the radius and the apex of the wing, the other before the middle; neuration wholly pale. Posterior wings with *no dark rounded spot at end of radius,* and almost without markings, except a few spots in the area between subcosta and sector, and a faint indication of a darker line along the series of gradate nervules.

♀. Length of body, 10 mm. Expanse of wings, 33 mm; length of anterior wing, 15½ mm., breadth, 12 mm.; length of posterior wing, 12 mm., breadth, 8 mm.

Hab.: Birmah (one example in my collection).

In size, and also in general appearance, this species is similar to *Ps. insolens,* McLach., but the markings of the wings are much fainter, and there is no subapical rounded spot in the posterior wings, a character so universal in the Australian species as to be of almost generic value.

Ps. birmana differs also from all the Australian species, except *Ps. Meyricki,* McLach., in the absence of a line of connecting oblique nervules in the costal area, which line is somewhat differently placed in the various species (in *Meyricki* there are indications of these nervules at the extreme base); *zebra,* Brauer, is unknown to me, and the description does not allude to either the presence or absence of this line of nervules.

In *Ps. birmana* the costal margin is more abruptly dilated at the base than in the Australian species, except *Ps. elegans,* Guér., and perhaps *Ps. mimica,* Newm. On the other hand, the posterior wings seem to be slightly narrower in proportion than in the Australian species. There is a slight difference in the dilatation at the apex of the space between the subcosta and sector alluded to in the description.

According to neuration the species may be divided thus:—

1. No line of oblique (gradate) nervules in the costal area of either pair of wings (*zebra,* Brauer, uncertain); only two series of transverse gradate nervules in the anterior wings—*Meyricki,* McLach., *birmana,* McLach.
2. With a line of such nervules in the costal area of both pairs of wings (*zebra,* Br., uncertain).
    - *a.* Four series of transverse gradate nervules in the anterior wings (the second rudimentary or incomplete)—*mimica,* Newm., *zebra,* Br.
    - *b.* Three series of such nervules—*elegans,* Guér., *cœlivaga,* Wlk., *insolens,* McLach.

Prof. Brauer (*l. c.*) questions *elegans* as perhaps not distinct from *mimica,* but in addition to the structural difference in neuration above alluded to, it differs in its smaller size, quite distinct character of markings, and in the much less produced anal angle of the anterior wings, which is very pronounced in *mimica.*

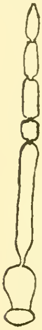
Lewisham, London:
November 7th, 1891.

A NEW SPECIES OF *ALEURODES.*

BY J. W. DOUGLAS, F.E.S.

ALEURODES RUBICOLA.

♂ ♀. Pale golden-yellow. Antennæ (fig. 1) paler, of 7 joints, the 1st very small; 2nd more than twice as long, stout, subpyriform; 3rd thinner, longest of all, nearly as long as the following four together; 4th half as long as 5th, which is one-third the length of 3rd; 6th and 7th each consecutively shorter. Eyes large, oval, black, facetted in rows, near the middle a triangular, granulose formation projects from the outer side, opposite the base of each antenna, half-way across the eye, so that the anterior portion of it is smaller than the posterior (this formation quite disappears under treatment with caustic potash, leaving the eye entire); rostrum long, dentate at apex, which only is black. Legs as usual in the genus; posterior tibiæ twice as long as the tarsi, 1st joint of tarsi the longest. Wings clear milk-white, spotless. Genitalia of ♂, fig. 4. Expansion of wings, ♀, 2 mm., ♂ rather less.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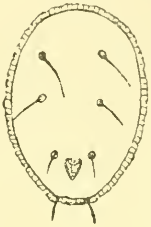
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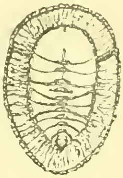
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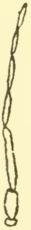
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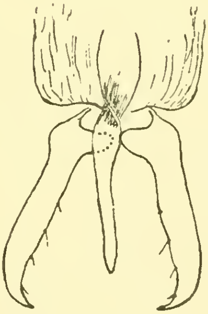
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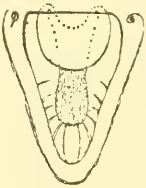
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Larva immature (fig. 2). Broad-short-oval, the marginal fringe of secretion distinct; the dorsal region with three pairs of long hairs, very pale and difficult to see, and one pair at the posterior margin; the *six* dorsal hairs are specially characteristic. These larvæ, about half-grown on August 24th, are transparent, of the colour of the under-side of the leaves on which they rest, and may be easily overlooked.

Larva mature (fig. 3), September 24th. Pale greenish-yellow, flat, broadly rounded oval; marginal area wide, thin, delicately striate transversely; on the outer sides anteriorly, shallowly or deeply incurved (at times, in the most advanced individuals, this amounts to an angular notch), indicating the posterior of the thoracic region, whence a distinct yellowish line extends quite across the marginal field (in some examples also are two or more marginal indentations irregularly placed posteriorly, but these have apparently been caused during growth by inequalities on the surface of the leaf); within this marginal space the outline of the body of the insect is denoted by an oval ring of raised, connected, white granules, and within this ring is a series of small, white, granulose, transverse ridges, highest in the middle, indicating the segments; these are most evident on the abdomen; beyond the anal orifice is a raised V-like formation, extending far on to the marginal area, and within the long, depressed triangle thus formed is a tongue-shaped organ (fig. 5, more enlarged); the marginal cercous fringe is now more or less imperfect, and the dorsal hairs have disappeared. Length, 1 mm.

This form, both in the imago and mature larva condition, is very like *A. ribium*, Doug., which lives on the leaves of red and black currant (*Ribes rubrum* and *nigrum*), (*cf.* Ent. Mo. Mag., xxiv, p. 265), but is rather smaller, and as larva is flatter, and not so regular in outline; the immature larva was not observed.

The imago also resembles *A. carpini*, Koch, which I found at Bexley Wood on hornbeam (*Carpinus betulus*) on May 28th, 1881, but the antennæ differ in their proportions (copy of Koch's figure No. 393 herewith [fig. 6] for comparison). The larva has not been described or figured, and I have been unable to obtain it.

A. vaccinii, Kunow, on *Vaccinium uliginosum* is also, by description, very like it, but there are some differences in the larva, as I have noted in the Ent. Mo. Mag., xxv, p. 256.

Whether these three are distinct species (and different also from *A. rubicola*, as I believe), or only one modified by the varied sustenance derived from the very diverse food-plants, is a question that cannot now be resolved in default of more full details of their structure at different stages of their lives. But in view of the structural characters appreciable only in the larva state of the similar pure white-winged species *A. phillyreæ*, Haliday, on *Phillyrea*; *A. immaculata*, Heeger, on ivy (*Hedera helix*); *A. dubia*, Heeger, on ash (*Fraxinus*); and *A. aceris*, Geoffroy, on *Acer platanoides*; whereby they are well differentiated (*cf.* Signoret, Ann. Soc. Ent. France, iv, Ser. viii, p. 388, *et seq.*), and considering that parallel differential structure may exist in those above-mentioned, I think it desirable to assume for the present that they and *A. rubicola* are good species.

As I have already stated (p. 200 *ante*), I saw *A. rubicola* abundant on a few bramble bushes (*Rubus*) growing on the sheltered side of a deep old gravel-pit at Blackheath on June 15th last. It was high noon, and they were enjoying their *siesta*, yet they readily took short flights on the least shaking of the bush, returning immediately to their shelter on the under-side of the leaves; the natural time for flight would be towards sunset, when they would be very active. None were to be seen after the end of June. The larvæ were only on the oldest leaves, which were young when the eggs were laid in June; sometimes there were 8 or 9, at others only 1 or 2, on a leaf. They would become pupæ, still adhere to the leaves when they had fallen, and thus hibernate.

The illustrations, and notes of observations on prepared specimens, have been kindly furnished by Mr. R. Newstead.

153, Lewisham Road, S.E.:
October, 1891.

ANNOTATED LIST OF BRITISH *TACHINIDÆ.*

BY R. H. MEADE.

(Continued from page 267).

20.—EPICAMPOCERA, Mcq.

Gen. ch.—Eyes hairy, nearer together in the males than in the females; palpi projecting and a little clavate, forehead very slightly prominent; epistome flat; cheeks minutely ciliated; facialia almost bare; antennæ with the second joint short, the third three or four times as long, thick, with the front surface convex, and the end rounded; abdomen oval, with the segments armed with setæ both on the disc and edges.

E. SUCCINCTA, Mgn.

Blue-black, with black palpi, antennæ, and legs; frontal stripe brown; sides of frontalia bluish; face white, with blue reflections; fronto-orbital bristles extending down one-fourth of the length of the face, four being placed below the base of the antennæ; arista long, thickened for about two-thirds of its length, and minutely pubescent; thorax indistinctly striped with four slender lines; scutellum black; abdomen glabrous, with white reflections, which assume the form of irregular transverse bands when viewed from behind; wings with the apical cross veins nearly straight, and the outer cross veins a little sinuous at the base. Not uncommon.

21.—EXORISTA, Mgn.

Gen. ch.—Species mostly of moderate size and oval shape; eyes hairy, rather widely separated in both sexes, and prolonged down the sides of the face; forehead mostly short; antennæ with the second joint rather short, and the third from twice to six times as long; front surface of the latter straight, or nearly so; arista with the second joint often a little elongated; cheeks bare;* facialia unarmed, or only ciliated with short weak bristles along their lower halves; abdomen sometimes with and sometimes without discal setæ on the middle segments; wings with the fourth longitudinal vein with an angular bend, and the first posterior cell partly open, and terminating a little before the tip of the wing.

The species are very numerous; almost all those that I have examined have four external dorso-central thoracic bristles behind the transverse suture, so I shall only mention them when they vary from that number; most of them also have the thorax and abdomen very similarly coloured and marked, so that the specific characters must be taken chiefly from differences in the colour of the palpi, scutellum, and legs, from the presence or absence of discal setæ on the central abdominal rings, from variations in the length of the antennæ (those of the male are often longer than those of the female), from the degree of extension of the fronto-orbital bristles on the cheeks, and other minor points of structure.

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* Sometimes the fronto-orbital bristles extend down the face, but they are never ciliated with fine hairs as in the preceding genus.

1 (10) Palpi black.

2 (3) Scutellum partly red .... 1. *vulgaris*, Fln.

3 (2) Scutellum black or grey.

4 (5) Fronto-orbital bristles extending to near the bottom of the cheeks... 2. *amplicornis*, Ztt.

5 (4) Fronto-orbital bristles not extending below the middle of the cheeks.

6 (9) Apical cross vein of wings nearly straight, and first posterior cell always a little open.

7 (8) Arista thickened to the middle........................... 3. *fimbriata*, Mgn.

8 (7) Arista long, slender, and only thickened at the base... 4. *mutabilis*, Fln.

9 (6) Apical cross vein much curved, and first posterior cell nearly or quite closed .... 5. *dubia*, Fln.

10 (1) Palpi red or partly red.

11 (26) Legs wholly or partly red or yellow.

12 (13) Legs wholly yellow .... 6. *vetula*, Mgn.

13 (12) Femora black, but tibiæ yellow or red.

14 (15) Fronto-orbital bristles in a double row in the males... 7. *biserialis*, Mcq.

15 (14) Fronto-orbital bristles in a single row in the males.

16 (21) Sides of the abdomen mostly marked with red.

17 (20) Middle abdominal segments without discal setæ.

18 (19) Frontal stripe as wide or wider than the sides of the frontalia... 8. *lucorum*, Mgn.

19 (18) Frontal stripe narrower than the sides of the frontalia... 9. *gnava*, Mgn.

20 (17) Middle abdominal segments armed with discal setæ... 10. *cheloniæ*, Rnd.

21 (16) Sides of the abdomen without red marks.

22 Colour whitish or yellowish-grey.

23 (25) Scutellum quite red .... 11. *leucophæa*, Mgn.

24 (23) Scutellum with only the tip red........................... 12. *albicans*, Fln.

25 (23) Scutellum black.. 13. *perturbans*, Ztt.

26 (11) Legs black.

27 (42) Scutellum red or partly red.

28 (31) Middle abdominal segments without discal setæ.

29 (30) Thorax indistinctly marked, scutellum all red .... 14. *fauna*, Mgn.

30 (29) Thorax distinctly striped, scutellum only red at the tip... 15. *acronyctarum*, Mcq.

31 (28) Middle abdominal segments with discal setæ.

32 (35) Abdomen with apex red.

33 (34) Wings with little cross vein clouded..................... 16. *ruficauda*, Ztt.

34 (33) Wings with cross veins clear .... 17. *apicalis*, Mgn.

35 (32) Abdomen with apex black.

36 (37) Palpi with tips only red .... 18. *lota*, Mgn.

37 (36) Palpi wholly red or yellow.

38 (41) Apical cross vein of wings curved.
39 (40) Wings with cubital appendix .... 19. *grandis*, Ztt.
40 (39) Wings without appendix.................................... 20. *affinis*, Fln.
41 (38) Apical cross vein straight .... 21. *noctuicida*, Rnd.
42 (27) Scutellum quite black .... 22. *jucunda*, Mgn.

E. VULGARIS, Fln.

This, which may be considered as the typical species in the genus, with which many of the others may be compared, may be known from all the other British ones with which I am acquainted by having the palpi, antennæ and legs black, and the scutellum with a red apex.* The eyes are widely and almost equally separated in both sexes; the fronto-orbital bristles have four or five setæ, which extend on to the cheeks in an even row below the roots of the antennæ; the latter have the third joint usually four times as long as the second, with the front margin nearly or quite straight; the arista has the second joint somewhat elongated, and the third thickened for fully half its length; the facialia are mostly ciliated along their lower halves with small bristles; the thorax is dull black, covered with hoary pubescence and marked with four longitudinal lines, the central pair being narrow and the outer ones irregular and maculiform; the abdomen is hoary on the sides and front margins of the rings, and has their posterior edges and a central dorsal line black; the segments are armed with setæ both on the edges and disc; the wings have the apical cross vein a little curved, and the outer one slightly sinuous; the legs have the hind tibiæ ciliated with a nearly even row of bristles, which have one or two longer ones among them.

This species, which is one of the most common of all the *Tachiniidæ*, is exceedingly variable both in size and other characters; thus the third joint of the antennæ is sometimes not more than three times as long as the second, much thickened, and rounded at the end, when it probably becomes the *T. magnicornis* or *T. rotundicornis*, Ztt. Again, the palpi are often testaceous at their ends; the facialia also are sometimes nearly or quite bare, and the scutellum is occasionally black instead of having the end pale.

E. AMPLICORNIS, Ztt.

This is rather an aberrant but well marked species. It is narrow and oblong in shape; the forehead is rather prominent; the eyes in the male approximated; the antennæ have the third joint about three times the length of the second, very thick, with the extremity rounded, and the front surface rather concave; the arista is rather short and thickened to beyond the middle; the fronto-orbital bristles extend down the cheeks almost to the bottom of the face, there being about eight below the roots of the antennæ; the facialia are almost bare; the palpi are black; the thorax is black, marked with four rather indistinct stripes; the abdomen is grey, tessellated with black; the first segment is nearly as long as the others, and they are all armed with setæ on the disc and edges; the scutellum is black or grey; the wings have the third longitudinal vein armed at its base with a row of six or seven setæ; the outer cross vein is seated nearly one-third nearer to the angle of the fourth longitudinal than to the little cross vein, the apical cross vein is a little curved, and terminates a little before the apex of the wing, leaving the first posterior cell slightly open. Very rare. I have only seen one specimen (♂), which I captured near Buckingham in June, 1878. Zetterstedt refers this fly to Meigen's genus *Tryphera*, but I think it belongs more properly to *Exorista*, unless it be placed in a new genus.

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* See remarks upon *Ex. parcus*, Rnd., at the end of this genus.

E. FIMBRIATA, Mgn.

This species is very similar in general appearance and character to *E. vulgaris*, but differs by having the scutellum quite black, by the general colour being more glabrous and bluish-black, by the eyes being nearer together, especially in the males, and by the antennæ being shorter, those of the male having the third joint only between two and three times the length of the second; the abdominal segments have setæ both on the disc and edges. Not common. I have captured it in Kent and in Oxfordshire.

E. MUTABILIS, Fln.

This is one of the smallest Tachinids, being only about 4 mm. long; it is placed by Fallen, Zetterstedt and Meigen among those species which have naked eyes,* but the specimen which I possess has them decidedly hairy, though the hairs are very short. The palpi, scutellum and legs are all black, the eyes are said to be somewhat approximated in the males, but are widely separated in the females; the forehead is rather prominent; the antennæ have the second joint a little elongated, and the third joint from two to three times as long; the arista is very long and thin, only thickened for a short distance at the base and slightly pubescent; the thorax is grey and marked by four slender black stripes; the abdomen is also grey with black tessellations, which assume the form of semilunar spots or marks at the bases of the second and third segments, which are armed with both discal and marginal setæ; the wings are a little nigrescent, the apical cross vein terminates near the apex, the first posterior cell is nearly closed, and there are three or four small setæ at the base of the third longitudinal vein.

I have only seen one female specimen of this little species, which I captured near Ulverston in Lancashire in August, 1888; the male is said to be more nigrescent and less distinctly marked. The abdomen of this fly is spotted in a very similar manner to that of *Nemorilla floralis*, Fln.

E. DUBIA, Fln.

This little species is also aberrant, and Rondani suggests that it should be placed in a new genus, which he would name APOROMYIA; its chief peculiarities are—first, the insertion of the antennæ opposite the centre of the eyes, and not as in other species of *Exorista* a little above it; second, the almost or quite complete closure of the first posterior wing cell; and third, the position of the outer cross vein, which is nearly in the centre between the little cross vein and the bend of the fourth longitudinal. The eyes are approximated in the male; the antennæ in the same sex have the third joint only twice as long as the second, it is rather longer, however, and thicker in the female; the palpi are usually black, but sometimes rufous; the thorax is shiny black-brown in the male and indistinctly striped, grey

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* It would thus be either a *Tachina* or a *Masicera*.

and marked with four lines in the female; the abdomen is grey, short and oval, tessellated with brown, and armed with setæ both on the disc and edges of the segments; the wings are tinged with brown, especially along the fore border, and the apical cross vein is deeply curved. This species closely resembles the *Tryphera umbrinervis*, Ztt., and I believe that they are only varieties of the same species. Not rare.

E. VETULA, Mgn.

This species has the legs entirely yellow, together with the palpi and scutellum; the facial angle is oblique; the eyes are widely separated; the antennæ are long, the first and second joints are short and rufous, the third is five or six times the length of the second, rather narrow, and black or grey; the thorax and abdomen are both brown, coated with ochreous pubescence; the former is marked by four black stripes, the latter is tessellated with brown, and armed with setæ on the disc and edges of the segments; the apical cross vein of the wings is nearly straight, and the outer one sinuous. Rare. I received one some years ago from Mr. Bignell, bred from a Lepidopterous larva found in the New Forest; Mr. Harwood, of Colchester, also gave me another a few months ago.

E. BISERIALIS, Mcq.

The eyes of the male are somewhat approximated; the fronto-orbital bristles are in two rows, the inner row extending half way down the face, the outer one consisting only of four setæ and not going beyond the base of the antennæ; the palpi are yellow and clubbed; the antennæ are black, with the third joint three to four times the length of the second; the arista is long and slender, and only thickened at the base; the thorax is grey, with four black stripes and has white shoulders, the scutellum is yellow; the abdomen is shiny metallic-brown (æneous), with somewhat narrow, white, transverse bands on the second and third segments, and is armed with rather small setæ on the disc and margins of the rings; the legs have the tibiæ testaceous or yellow. Very rare. I found a single male of this well marked species near Maidstone, in Kent, in June, 1888.

E. LUCORUM, Mgn.

The palpi, scutellum and tibiæ are rufous, also the sides of the first and second abdominal segments in the male. The frontal stripe is wider than the sides of the frontalia; the palpi are somewhat clavate at the ends; the antennæ have the third joint between two and three times longer than the second; the arista is long and slender, and only thickened along its basal third; the thorax is black and hoary, with four rather indistinct longitudinal lines; the abdomen is without discal setæ on the middle segments, and is tessellated with black and grey marks. Rare.

E. GNAVA, Mgn.

This species so closely resembles the former that I believe they are only varieties of the same. The frontal stripe is only as wide or even narrower than the sides of the frontalia; the third joint of the antennæ is fully three times as long as the second; the arista is thickened along half its length, and is less slender than in *E. lucorum*, and the redness on the sides of the abdomen extends a little on to the third segment. This is also rare. Mr. Bignell sent me a pair some years ago bred from *Orgyia pudibunda*, and Mr. Dale has one in his collection reared from the same insect.

E. CHELONIÆ, Rnd.

This is also closely related to the two preceding species, but differs from them both by having the middle abdominal segments armed with discal setæ; it resembles *E. lucorum* by having the arista long and slender, and only slightly thickened at the base, but has a rather narrow frontal stripe as in *E. gnava*. Not uncommon. It is in Miss Decie's as well as Mr. Dale's collection, and Mr. Inchbald sent me several specimens which he bred from *Arctia caja* and *A. lubricipeda*.

(To be continued). XXVIII - 17

Calliphora erythrocephala, Mg., from a wasp's nest.—At page 170 of the June (1891) number of the Ent. Mo. Mag., Mr. Bignell mentions the breeding of *Homalomyia canicularis* from an old nest of *Vespa vulgaris*; he was good enough to give me some of the pupæ taken from the nest, amongst which were three more than twice the size of the others, and from these emerged three fine specimens of *Calliphora erythrocephala*, Mg., one of the two species which are usually classed together as "blow-flies." The smaller pupæ all produced *Homalomyia canicularis*, L., but no hyper-parasites.—CORYNDON MATTHEWS, Ivybridge: *November 9th*, 1891.

Interesting variation of Pieris napi in Ireland.—To my kind friend Mr. Percy Russ, of Sligo, we are indebted for almost all we know of the interesting forms of *Lepidoptera* to be found in that district, and now he has made what I think is another distinct addition to our knowledge. There is found in the Alps a well known and most striking dark variety of *Pieris napi*, called *bryoniæ*, in which the nervures on the upper-side of fore- and hind-wings are very broadly bordered with dark scales in such a manner that the insect, which is of a brownish-yellow ground-colour, is almost covered with broad, dark grey, longitudinal stripes. Mr. Russ has now sent for my information specimens of female *napi*, in which the nervures of the upper-side are broadly scaled quite to the hind-margins of the wings in the same manner, and only differing in the ground-colour, which is yellowish-white. This variety differs greatly from the forms with *black* nervures and apices from the *north* of Ireland, and is quite the nearest approach to var. *bryoniæ* which has come under my observation in these islands.—CHAS. G. BARRETT, 39, Linden Grove, Nunhead: *November 9th*, 1891.

Varieties of British butterflies.—Among the specimens sent from Sligo by Mr. Russ I find worthy of special notice: *Pieris brassicæ*, ♀, of large size, much suffused with grey, with a very broad black apical blotch, from the inner edge of which black streaks run to the uppermost black spot. *Pieris rapæ*, ♂, pure white, hardly a trace of even the apical dark blotch. *Satyrus Semele* and *Epinephile Janira*, males, with the blotches of pale colour above, as in the females, though smaller. *Vanessa cardui*, of an exquisite rosy colour, and *Polyommatus Alexis*, males, of very pale blue, from abundance of brilliant silvery-white hairs, and with decided round dots, or sometimes spots, along the hind-margin at the upper-side, and a female with white central spot on the hind-wings. These variations, light and dark, from the same remote locality, are highly interesting and instructive.—Id.

Melanic variety of Aplecta nebulosa, Tr.—Mr. J. Collins, of Warrington, who is an extremely intelligent and observant collector, has sent five specimens of *Aplecta nebulosa*, which have been reared, with many of more ordinary character, by himself and a friend from larvæ collected at Delamere Forest, Cheshire. These specimens are of a very beautiful melanic form, the fore-wings being entirely suffused with shining smoky-black, except the orbicular and renal stigmata, and the shaded subterminal line, which are of a silvery pale grey, and the cilia, which are *white*. The finish, which is given by the white cilia to the glossy blackish wings, is something exquisite. The hind-wings are somewhat darker than in ordinary specimens, but not strikingly so, the dark colour, which forms a sort of ill-defined margin usually, is in these spread over the hind-wings. The other specimens, reared at the same time, are well marked, darker than the usual southern examples, but not suffused, so that the melanic form is not led up to by closely intermediate forms, and this being the case, the varietal name "*Robsoni*," which Mr. Collins has proposed for the melanic variety, appears unobjectionable.—Id.

Stauropus fagi double-brooded.—*Stauropus fagi* has been emerging here for the second time this season. Mr. J. Clarke, of this town, has had several emerge from August pupæ; one in an open box in his garden, and another in a sleeve before he had removed it from the tree. On October 15th the same gentleman exhibited a fresh unset specimen at a meeting of the Reading Natural History Society. My brother sleeved his larvæ on an apple tree; they pupated in August, were then kept in a shed in his garden, and on October 30th he found a female had emerged. On November 4th, a general holiday here, I got a whole day off in the woods. I was asked to leave the first wood I entered as they were about to shoot it over that day. I had no success in the second wood; but in the afternoon, in a third and smaller wood, I found a male *fagi* on a tree, and just before dark I got another male on an old stump of a tree which had been broken off. Both these moths were rather battered, and had evidently been out some time. It appears, then, there is a partial second appearance of *fagi*, and October is the month to look for it. But what I think is the strangest thing about this is, there are other entomologists here who have pupæ of *fagi* (in one case a large number, 70 or 80), pupæ which turned in very early. The larvæ having been fed up indoors, none of these have emerged, whilst those in the wilds, and those fed under more natural conditions, have some of them been coming out.—W. Holland, 111, Southampton Street, Reading: *November 6th*, 1891.

P.S.—All the other collectors here are on the look out now, and Mr. Barnes, of this town, found another male on the 6th. No female yet.—W. H.: *November 9th.*

Change of habit induced by local conditions.—The following remarks tend to show how imprudent it is to judge of the habits of common insects from a purely local standpoint.

Last month I took a short trip to the Channel Islands, and was struck by the great abundance, in all the Islands visited, of *Pararge Ægeria*, which, at that season, was by far the most common butterfly. I am aware there are exceptions, but in Britain, as a rule, we are accustomed to associate the insect with rides and pathways in woods, often in the densest parts, whence its English name, "The Speckled Wood." Whatever there may have been at one time in the Channel Islands, there is now no approach to the semblance of a "wood" in the ordinary English application of the term, though the sloping sides of some of the beautiful, but short, deep valleys are thickly wooded. But *P. Ægeria* is found in great numbers in all the innumerable roads and lanes which intersect the open country in the principal Islands. In fact, its habits there are precisely those of its congeners, *P. Megæra* and *Tithonus*. I am assured that in certain parts of England the insect has similar habits, but we commonly, and rightly, associate it with woods.

This reminds me of a parallel case in the opposite direction. In this country we usually associate *Satyrus Semele* with open, often treeless, rocky places, downs, and heaths. In August, 1864, I made what was practically my first entomological excursion on the continent, and visited the Forest of Fontainebleau under the guidance of a veteran French Lepidopterist (now no more), who then resided in the town of that name. In the densest and darkest parts of the Forest *S. Semele* was to be seen in abundance feeding at the exuding sap of huge trees, in company with several other non-British *Satyridæ*, and *Catocala promissa* or *sponsa*, or both. This was a revelation to me, and quite upset my insular ideas.—R. McLachlan, Lewisham, London: *October 26th*, 1891.

Coleoptera from South Wales.—During the month of September I have been collecting *Coleoptera* in the neighbourhood of Llantrissant, S. Wales. I have chiefly collected in the river Ely, and the adjoining fields. I have only found time to identify a portion of the insects taken by me. Those identified include the following:—*Notiophilus palustris*, *Bembidium decorum*, *punctulatum*, *rufescens*, *tibiale*, *atrocœruleum*, *femoratum*, and *littorale*, in the dry river bed; *B. quadrimaculatum*, in logs, &c.; *Deronectes latus* and 12-*pustulatus*; *Cœlambus versicolor*; *Hydroporus rivalis*, *septentrionalis*, and *lepidus*—the latter in great numbers in a pond close to the river; *Limnebius truncatellus* and *nitidus*; *Hydræna gracilis*, *nigrita*, and *pygmæa*; *Henicocerus exsculptus*; *Megacronus cingulatus*; *Quedius cruentus*; *Habrocerus capillaricornis*; *Othius myrmecophilus*; *Lathrobium multipunctum*; *Stenus cicindeloides* and *guttula*; *Prognatha quadricorne*; *Cephennium thoracicum*; *Cryptarcha strigata*; *Diphyllus lunatus*; *Litargus bifasciatus*; *Antherophagus pallens*; *Endomychus coccineus*; *Georyssus pygmæus*—my first specimen of this insect was taken in the pond after heavy rain; I subsequently found it in some numbers at one spot on the shelving sandy bank; the beetles seemed to prefer places where the bank was vertical for a few inches, they were climbing up and down these diminutive cliffs with their sandy coatings looking like little grains of sand. *Elmis æneus*, *parallelopipedus*, and *Volkmari*; *Limnius tuberculatus*; *Potaminus substriatus*—I took two specimens of this insect in scum, leaves, sticks, &c., collected by the river, and held by a tree which had fallen across the stream; this scum seemed very attractive to a large number of beetles and flies, when the sun had been shining on it it was quite warm, which, no doubt, accounted for the fact. *Aphodius subterraneus, porcus*, and *obliteratus*; *Ægialia sabuleti*—one in the scum, and one in the mouth of a rabbit's hole close to the river; *Serica brunnea*; *Cryptohypnus 4-guttatus*; *Gymnetron labile* and *pascuorum*; *Cœliodes subrufus*; *Gonioctena pallida*; *Mniophila muscorum*; *Cassida murræa, fastuosa*, and *obsoleta*; *Cassida murræa* was plentiful in one field on fleabane (*Inula dysenterica*), upon which *Lasia globosa*, including the unspotted variety, also occurred. *Cassida fastuosa* occurred in the same field, and I think it must have been on the fleabane; I only took a single specimen.—Arthur J. Chitty, 33, Queen's Gate Gardens, S.W.: *October* 21*st*, 1891.

Hydroporus granularis, L.—Additional localities for this insect are Oxshott and Sandwich. I found it at both these places in the early spring, in company with *Copelatus agilis*; my specimens are almost black.—Id.: *November*, 1891.

[*H. granularis* is a local species, but very common in some places, *e. g.*, in Askham Bog, York.—W. W. F.]

Coleoptera at Fort William and Ilkley.—During a short visit, from August 26th to September 3rd, the usual wet weather prevailing, I made the ascent of Ben Nevis with some young friends. We had not much time, as it was necessary to reach the summit as quickly as possible, but I noticed *Aphodius contaminatus* swarming at the base. In descending, by examining damp mossy spots, *above the* 3000 *feet line*, we found a pair of *Nebria Gyllenhali*, a pair of *Patrobus septentrionis*, and a single specimen of *Miscodera arctica*. At Ilkley, a fortnight later, the weather was much better; vigorous searching under stones on Rumbold's Moor produced *Bradycellus cognatus* and *similis* in abundance, and *Olisthopus rotundatus* in profusion; also a pair of *Acidota crenata*, and single specimens of *Carabus nitens*, *Miscodera arctica*, and *Necrophorus ruspator* (flying). Many commoner species abounded.—Alfred Thornley, South Leverton Vicarage, Lincoln: *October* 12*th*, 1891.

Re-union between the same beetles.—With reference to the re-union between moths noticed at pp. 274 and 303 *ante*, it is of interest to observe that the same thing has been seen among *Coleoptera* by Mr. G. C. Davis, Michigan, recorded as follows in "Insect Life," vol. iv, p. 65 (October, 1891):—

"*Lyctus striatus.*—We have recently found them issuing from a red oak floor in one of our College halls. The floor was laid two years previous, and the lumber was seasoned at that time. The beetles issued from the sap wood only, and probably were feeding there when the tree was sawed into lumber. In order to learn more of their habits quite a number were placed in a glass jar containing a branch of green oak, one of dead oak, and a seasoned stick from the shop. The beetles preferred the latter when first introduced, and made themselves at home by boring a hole entirely through it diagonally the first night. Mating took place in a few hours after issuing, and eight days later ovipositing was first noticed. Mating again took place before each egg was deposited. This seems essential, as a female was placed by herself immediately after mating the first time, and although watched for several weeks after the others had died, no sign of ovipositing was noticed. The branch of green oak was preferred in depositing the eggs, and none were placed on the stick from the shop. Ovipositing occurred about once in half an hour, and lasted but one day. One week after ovipositing young larvæ were found."—Eds.

Gonioctena litura—red variety.—The Rev. Canon Fowler, in a note on *Coleoptera* taken by him at Charmouth (*ante* p. 304), mentions this insect, of which he had not seen a record. On two occasions I have taken this red variety, once at Weybridge when collecting with the late Dr. Power, and once at Higham in Suffolk. In the last named locality the insect was in the greatest abundance, of course on broom, and quite half the specimens I took were bright scarlet, but a few days after death the colour faded away, leaving no trace of redness.—Arthur Cottam, Eldercroft, Watford: *October* 31*st*, 1891.

Cneorhinus ludificator and C. geminatus.—[Mr. Albert C. F. Morgan, of Villa Nova da Gaya, Portugal, writes in a letter to me as follows.—J. W. Douglas].

"*Cneorhinus ludificator* has appeared here this year in great abundance on the vines, and, curiously enough, *Cneorhinus geminatus* has occurred for the first time in large numbers on the vines in France. Singular, it seems to me, that two different species, each in its own geographical habitat, should have appeared simultaneously in great quantities this year."

[*C. ludificator*, Gyll., appears to be regarded as a variety of *C. hispanus.*—W. W. F.]

Icerya Purchasi at St. Helena.—Mr. D. Morris, Assistant Director of the Royal Gardens, Kew, has sent for identification specimens of a Coccid, supposed by him to be *Icerya Purchasi*, just received from St. Helena. They were found there on some rose bushes which had been imported from the Cape of Good Hope. There is not the least doubt that the specimens received are females of *Icerya Purchasi*; and if the brood of which they are samples be not extirpated at once by burning all the plants on which they exist, so as to destroy all eggs and young larvæ, they would form the beginning of a pest that would be intensely serious in such a small island. The probability is that they were introduced as eggs or larvæ and so escaped observation.—J. W. Douglas, 153, Lewisham Road, S.E.: *November* 12*th*, 1891.

Societies.

Birmingham Entomological Society: *Oct.* 19*th*, 1891.—Mr. R. C. Bradley in the Chair.

Rev. C. F. Thornewill showed a number of insects taken on Cannock Chase this year, including a melanic variety of *Cymatophora duplaris*, also a collection made in Bucks this year, including *Cleora lichenaria*, *Boarmia roboraria*, *Aventia flexula*, *Phorodesma bajularia*, &c. Mr. G. W. Wynn showed a beautiful series of *Geometra papilionaria*, bred from Wyre Forest larvæ. Mr. P. W. Abbott showed *Setina irrorella*, *Agrotis lucernea*, and *A. lunigera*, long series from the Isle of Wight. Mr. R. C. Bradley showed *Acidia cognata* from Sutton, and *A. heraclei* from Moseley. Rev. C. F. Thornewill read notes on the recent discovery of *Stilbia anomala* on Cannock Chase, in abundance. Until last year it was not known to be a Midland insect, and then it was found by Messrs. Thornewill and Freer in such numbers on the Chase that the latter took 150 specimens, and this year it was equally common.

November 2nd, 1891.—Mr. R. C. Bradley in the Chair.

Mr. Bradley showed *Gonyglossum Wiedemanni* from Sutton. Mr. H. J. Sands showed *Calligenia miniata* from the New Forest. Mr. W. Harrison showed a specimen of *Epione apiciaria*, taken at Harborne so late as October 3rd this year. Mr. G. W. Wynn showed *Nudaria mundana* from Cleeve Prior. Mr. C. J. Wainwright showed insects bought at the Rev. G. H. Raynor's sale, including fine variable series of *Hypsipetes elutata*, *Cidaria russata*, &c., and specimens of *Eupithecia irriguata*, *subciliata*, &c.—Colbran J. Wainwright, *Hon. Sec.*

Lancashire and Cheshire Entomological Society: *November 9th*, 1891.—The President, Mr. S. J. Capper, F.L.S., F.E.S., in the Chair.

Mr. Robert Newstead, F.E.S., read a paper, entitled, "General notes on the scale insects, *Coccidæ*." The author gave a brief resumé of the work done by the earlier naturalists, and enumerated types of the principal genera (of which he had drawn large coloured diagrams in illustration). In the course of his remarks, he described the distinctive characters, and exhibited drawings of the following new species:—*Lecanium assimile*, n. sp., on *Aster*, at Colwyn Bay, *L. minimum*, n. sp., on *Areca*, under glass, Cheshire; *Pulvinaria persicæ*, n. sp., on peach, Cheshire; *Pseudococcus associalis*, n. sp., on *Ribes*, Yorks; *Ripersia Tomlinii*, n. sp., on grass roots in ants' nests, Guernsey; *R. pulveraria*, n. sp., under leaf-sheaths of *Agrostis*, Cheshire. Mr. Newstead exhibited specimens of 172 species of *Coccidæ*, including nearly all the known British species. Mr. Gardner exhibited *Coccus cacti* and *Carteria lacca*, the latter with their products. The Secretary: *Aspidiotus personatus*, *Vinsonia pulchella*, and *Lecanium oleæ*, the latter were much broken by some Lepidopterous (?) larvæ, which had formed silken tunnels under the scales. The President exhibited melanic and other forms of *Liparis monacha*. Mr. Gregson, varieties of *Dianthæcia conspersa* and *Abraxas grossulariata*, bred by him this year. Mr. Walker, water-colour drawings of *Deilephila galii*; and Mr. Stott a *Noctua*, exhibited some time ago, which has since been pronounced to be a variety of *Epunda lichenea* by Mr. Barrett. —F. N. Pierce, *Hon. Sec.*, 143, Smithdown Lane, Liverpool: *November 13th*, 1891.

The South London Entomological and Natural History Society: *November 12th*, 1891.—W. H. Tugwell, Esq., President, in the Chair.

Mr. Cooper exhibited a variety of *Abraxas grossulariata*, L., being well banded, and there being no trace of yellow in the markings of the wings. Mr. Auld, a hornet's nest from Ware, Herts. Mr. West (Streatham), *Polia chi*, L., from the Lake District, one specimen being extremely dark. Mr. Herbert Williams, wine corks bored by the larvæ of some insect, which were doing a considerable amount of damage, over two hundred bottles of port having been attacked. Mr. Forrester showed *Bombyx quercûs*, L., variety *callunæ*, Palmer, from Perthshire. Mr. E. Joy, *Epinephele hyperanthes*, L , the variety *Arete* and others approaching it. Mr. C. G. Barrett, a variety of *Argynnis Aglaia*, L., taken in Norfolk, and *Lycæna argiades*. Mr. Oldham, *Lepidoptera* from Epping, including a specimen of *Apamea ophiogramma*, Esp., taken in the Forest, and an extremely dark form of *Cerastis spadicea*, Hb.; Mr. South remarked that this last species should be called *ligula*, as it was not at all like Hübner's figure of *spadicea*. Mr. Tugwell, series of *Melanippe galiata*, Hb., from Huddersfield, and the Southern form for comparison. Mr. Tugwell also exhibited a parasitic fungus which he thought was probably one of the *Entomophthoræ*, a tribe parasitic on insects, the fungi had appeared in the mould of one of his breeding cases, in which were eighty pupæ of *Eucosmia certata*, Hb. Mr. Adkin again exhibited the specimens of the Tortrix which Mr. Carpenter had named *Donelana*, and remarked that he had been stated to have exhibited them as *Tortrix Steineriana*, var. *Dohrinana* ; he had, however, when exhibiting them said he considered them to be *Tortrix viburnana* ; he had now a specimen of the var. *Dohrinana* from Dr Standinger's collection, and Mr. Tutt had brought his series of this variety which he had received from Herr Hoffman, and Mr. Barrett had brought specimens of *Steineriana*. Mr. Barrett said that he had been in correspondence with Mr. Carpenter on the subject, and was still of opinion that they were small specimens of *viburnana*. Mr. Carpenter said that although the larvæ had fed on pine, one example had fed equally as well on *Vaccinium*. Mr. Tutt said in this part of the genus there were some six or eight species very closely allied, and it was difficult to separate them after studying the variation.—H. W. Barker, *Hon. Sec.*

Entomological Society of London: *November 4th*, 1891.—Dr. David Sharp, M.A., F.R.S., Vice-President, in the Chair.

Major John Nathaniel Still, of Tiverton, Devon, and the Junior United Service Club, Charles Street, St. James's, S.W., was elected a Fellow of the Society.

Mr. W. F. Kirby exhibited a series of a very dark-coloured form of *Apis* reared by Mr. John Hewett, of Sheffield, from bees imported from Tunis, and which he proposed to call "Punic Bees." They were larger than the black *Apis unicolor*, Latr., of Mauritius and Bourbon, and were almost entirely black, except in the legs, which were of a more or less reddish colour.

Mr. C. G. Barrett exhibited five melanic specimens of *Aplecta nebulosa*, reared by Mr. Collins, of Warrington, from larvæ collected in Delamere Forest, Cheshire, and described by him, in the "Proceedings of the Lancashire and Cheshire Natural History Society," as *A. nebulosa*, var. *Robsoni*, in honour of Mr. John E. Robson, of Hartlepool. Mr. Barrett also exhibited a beautiful variety of *Argynnis Aglaia*, taken in Norfolk by Dr. F. D. Wheeler, and two specimens (male and female) of

Lycæna argiades, taken in August, 1885, on Bloxworth Heath, Dorsetshire, by Mr. C. O. Pickard-Cambridge and Mr. A. Pickard-Cambridge respectively.

Mr. H. St. John Donnisthorpe exhibited a colection of *Coleoptera*, comprising about thirty-six species, made in a London granary in 1890 and 1891. The genera represented included *Sphodrus*, *Pristonychus*, *Calathus*, *Quedius*, *Creophilus*, *Omalium*, *Trogosita*, *Silvanus*, *Lathridius*, *Dermestes*, *Anthrenus*, *Corynetes*, *Ptinus*, *Niptus*, *Anobium*, *Blaps*, *Tenebrio*, *Calandra*, *Bruchus*, &c.

Mr. A. B. Farn exhibited a series of specimens of *Eubolia lineolata*, bred from eggs laid by a specimen taken at Yarmouth. The series included several remarkable and beautiful varieties, and the size of the specimens was much above the average.

The Rev. Dr. Walker exhibited specimens of *Argynnis Ino*, *A. Pales*, and *A. Frigga*, from Norway.

Mr. B. A. Bower exhibited, for Mr. J. Gardner, specimens of *Nephopteryx splendidella*, H.-S., *Botys lupulinalis*, Clk., and *Bryotropha obscurella*, Hein., taken at Hartlepool last June and August.

Mr. R. Adkin exhibited two very dark specimens of *Peronea cristana* from the New Forest.

Colonel C. Swinhoe exhibited, and remarked on, types of genera and species of moths belonging to the *Tineina*, all of which had been described by Walker, and placed by him amongst the *Lithosidæ*.

Mr. H. Goss exhibited specimens of *Callimorpha Hera*, taken in August last by Major-General Carden in South Devon, and observed that the species appeared to be getting commoner in this country, as Gen. Carden had caught seventeen specimens in five days. Mr. Goss said that the object of the exhibition was to ascertain the opinion of the meeting as to the manner in which this species had been introduced into this country. A long discussion on this subject and on the geographical distribution of the species ensued, in which Mr. G. T. Baker, Mr. Stevens, Mr. Barrett, Colonel Swinhoe, Mr. McLachlan, Mr. Verrall, Mr. Elwes, Mr. Fenn, Mr. Jacoby and others took part.

Mr. C. J. Gahan contributed a paper, entitled, "On South American species of *Diabrotica*: an Appendix to Part II."

Mr. McLachlan contributed a paper, entitled, "Descriptions of new species of holophthalmous *Ascalaphidæ*."

Mr. W. L. Distant communicated a paper, entitled, "Descriptions of four new species of the genus *Fulgora*."

Mr. F. Enock read a paper, entitled, "Additional notes and observations on the life-history of *Atypus piceus*." Every detail in the life-history of this spider was most elaborately illustrated by a large number of photographs, made by Mr. Enock from his original drawings, and shown by means of the oxy-hydrogen lantern. A discussion followed, in which Mr. C. O. Waterhouse, Dr. Sharp, Mr. G. C. Champion, the Rev. A. E. Eaton, Mr. P. Crowley, and others took part.—H. Goss, *Hon. Secretary*.

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ERRATA.

Page 44, line 6 from bottom, for "*quadriolata*" read "*quadriaurita.*"
„ 72, „ 20 „ top, „ "*concinnus*" read "*caurinus.*"
„ 77, „ 10 „ bottom, dele "accidentally."
„ 111, „ 1 for "*elegans*" read "*speciosa.*"
„ 302, „ 17 „ „ „ "*leucanipennella*" read "*leucapennella.*"
„ 308, „ 18 „ „ „ "*Isocelipteron*" read "*Isoscelipteron.*"

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